



TECHNICAL MEMORANDUM

Traffic Impact Analyses Enhanced Option for the Expansion of Bal Harbour Shops Using Theoretical Development Scenarios 1 and 2

Prepared by: Henry A. Fandrei, P.E., PTOE, Fandrei Consulting, Inc.
Florida P.E. # 31478

Date: January 9, 2017

This memorandum summarizes the analyses of traffic impacts using two theoretical scenarios for calculation of trips associated with the expansion of Bal Harbour Shops (BHS). The memo of June 24, 2015 has been revised to reflect the Enhanced Plan for Bal Harbour Shops submitted to Bal Harbour Village in January of 2017.

The Village Manager directed the Corradino Group (TCG) to analyze the traffic impacts associated with the expansion using each of these scenarios in April of 2015. These analyses were performed by the Corradino Group for the Base Option for Expansion at Bal Harbour Shops.

The Enhanced Plan for the improvements to Bal Harbour Shops submitted in January 2017 has a Gross Leasable Area of less than 810,000 square feet. The Village Manager has asked that BHS and their traffic engineering consultant, Fandrei Consulting, Inc. (FCI) provide supplemental analyses of traffic impacts for the Enhanced Plan using the levels of trip generation associated with the theoretical Scenarios 1 and 2

To be conservative and to allow for adjustments to the plan, the analyses described in this memorandum assume a GLA of 855,000 square feet for the expansion of Bal Harbour Shops. In other words, these updated analyses address the traffic impacts of the Enhanced Plan or any similar plan for Bal Harbour Shops with a GLA of 855,000 square feet or less.

Trip Generation

Bal Harbour Shops has a trip generation rate of 1.28 trips for each 1,000 square feet of leasable area (Table 1). This means that the Shops' 463,477 square feet of gross leasable area generates 593 trips (256 in and 337 out) during the p.m. peak hour. The trip generation rate for BHS has remained consistently low over the past few years. Several studies made by FCI since 2008 have confirmed this.

The rate of traffic generated by traditional shopping centers is 3.71 trips per 1,000 square feet of gross leasable area. This is almost 3 times as high as the rate for Bal Harbour Shops.

The trip generation scenarios addressed in this memorandum assume that after a history of low traffic generation rates, there will be major changes in the trip generation associated with Bal Harbour Shops.

The first of these, Scenario 1, assumes that the existing portion of Bal Harbour Shops will continue to generate trips at the current low rate, but that the expanded portion of Bal Harbour Shops (BHS) will generate traffic at a rate which represents an average of the current low rate and the much higher rate established by the Institute of Transportation Engineers for typical shopping centers.

Scenario 1 trip generation for the Enhanced Option is shown in Table 2 in the attachments.

Scenario 2 is far more extreme. This second scenario assumes that Bal Harbour Shops is converted into a traditional, Aventura Mall type, shopping center and will generate traffic like a traditional center.

It should be noted that a traditional shopping center with a GLA of 855,000 sq. ft. requires significantly more parking spaces than the number that will required by Bal Harbour Shops after the expansion. In other words, a traditional shopping center the size of Bal Harbour Shops, could not survive on this site without adding almost 700 new parking spaces beyond those that will be constructed as part of the expansion. This means the Village would have to approve construction of several additional levels to the proposed parking structure for this scenario to be viable.

Nevertheless, trip generation associated with this scenario was calculated and the theoretical impacts on the intersections at and near to Bal Harbour Shops were evaluated.

Trip generation for Scenario 2 is shown in Table 3 in the attachments to this memo.

Project Trip Assignment

Traffic for Scenario 1 and for Scenario 2 was then distributed to the roadway network using the assumptions and methodology from the original report.

Peak Season, Peak Hour traffic volumes with Scenario 1 conditions are shown in Table 4 and in Figure 1.

Peak Season, Peak Hour traffic volumes with Scenario 2 traffic volumes are shown in Table 5 and in Figure 2.

Signalized Intersection Levels of Service

Intersection Levels of Service were calculated for existing Peak Season, Peak Hour traffic and for Peak Season, Peak Hour traffic in 2020 after the physical and operational improvements associated with the enhancements to Bal Harbour Shops have been completed. The timing plans were re-optimized using the Synchro optimization process prior to doing the new Level of Service analyses. The results of the analyses for 1) existing conditions, 2) conditions in 2020 per the FCI analysis, 3) Scenario “1” and 4) Scenario “2” are shown in Table 6.

The results of the Synchro optimization provide for Level of Service D at Harding and 96th Street for Scenarios 1 and 2. This is shown in Table 6. However, after analyzing the results, it was discovered that the Level of Service at this intersection could be improved to LOS C by adjusting the signal timing (offset) for the signal at 96th Street & Byron. This improved Level of Service is referenced in the footnotes to Table 6.

After the proposed physical and operational improvements associated with the Bal Harbour Shops expansion are completed, levels of service and average delays will be at Level of Service C or higher except for Harding and 96th Street which may operate at LOS D. This occurs; even with the dramatic increases in driveway traffic associated with Scenarios 1 and 2.

Summary

After applying Scenario 1 and Scenario 2 traffic volumes to the road network, the overall effect of the proposed Bal Harbour Shops expansion and the accompanying transportation enhancements will be to maintain reasonable levels of service at signalized intersections within the community and provide for some improvement at the 96th Street & Collins. These analyses also suggest that there can be an improvement at Harding Avenue and 96th Street as well.

The author believes that Scenario 1 conditions are extremely unlikely to happen. The author also believes Scenario 2 cannot happen unless the Village would allow construction of several additional levels in the parking garage.

Driveway volumes calculated for Scenario 1 are 150% of the traffic projected for the Enhanced Option at Bal Harbour Shops and driveway volumes for Scenario 2 are 250% times the traffic projected for the Enhanced Option. The fact that these analyses continue to show acceptable levels of service with Scenario 1 and Scenario 2 traffic volumes demonstrates that the proposed expansion of Bal Harbour Shops will not create traffic problems within Bal Harbour Village.

Attachments

TABLES & FIGURES

Traffic Impact Analyses - Enhanced Option for the Expansion of Bal Harbour Shops
 Using Theoretical Development Scenarios 1 and 2
 January 9, 2017

Table 1 - TRIP GENERATION FOR BAL HARBOUR SHOPS

Driveway Volumes (P.M. Peak Hour between 4-6 p.m.)				
	Data Counted <u>Feb. 2014</u>	Yearly Average (f=0.90)	Adjust to Peak Sea. (f=1.02)	Directional Dist'n
Enter	285	256	291	43%
Exit	<u>374</u>	<u>337</u>	<u>381</u>	57%
Total	659	593	672	

Size of BHS = 463.477 ksf (gross leasable area)
Trip Generation Rate for BHS (Average Conditions) =
1.28 trips per 1000 sq. ft. of Gross Leasable Area

FCI June 2015

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 January 9, 2017

Table 2 - PM PEAK HOUR TRIPS WITH UP TO 855,000 SF - SCENARIO 1

	<u>Size</u>	<u>Units</u>	<u>Enter</u>	<u>Exit</u>	<u>Total</u>
Current Peak Season Trips into and out of B H S	463.477	ksf	291	381	672
New Leasable Area at Bal Harbour Shops	391.523 ¹	ksf			
Peak Season Trip Projection of Expansion per FCI ²			147	194	341
<i>Pass-By Adjustment per FCI</i>			0	0	0
Trips per ITE for 391.523 ksf Traditional Center ³			718	777	1495
<i>Pass-By Adjustment at 34% per ITE</i>			-244	-264	-508
Total Driveway Trips for the 2 Approaches for Expansion			865	971	1836
Average Driveway Trips for the 2 Approaches for Expansion	<u>433</u>	<u>485</u>	<u>918</u>		
<i>Average Pass-By Trips</i>			<u>-122</u>	<u>-132</u>	<u>-254</u>
Total Driveway Trips at BHS per Scenario 1			724	866	1590

¹ The assumed total size of 855.000 ksf is greater than plan being considered

² FCI trips based on FCI Technical Memo of Oct. 27, 2015, Table 2

³ Equation for LUC 820 - PM Pk Hr is: $\ln(T) = 0.67 \ln(X) + 3.31$ (48% Enter, 52% Exit)

Equation from Institute of Transportation Engineers' Trip Generation Manual, 9th Edition, p. 1563

Pass-By % from Institute of Transportation Engineers' Trip Generation Handbook, 3rd Edition, p. 242

FCI April 2016

Table 3 - PM PEAK HOUR TRIPS WITH UP TO 855,000 SF - SCENARIO 2

	<u>Size</u>	<u>Units</u>	<u>Enter</u>	<u>Exit</u>	<u>Total</u>
Total Trips into and out of Bal Harbour Shops ¹	855.0 ²	ksf	<u>1211</u>	<u>1312</u>	<u>2523</u>
Pass-By Trips (34%)			-412	-446	-858
Trips from BHS Site added to Road Network			<u>799</u>	<u>866</u>	<u>1665</u>

¹ Equation for LUC 820 - PM Pk Hr is: $\ln(T) = 0.67 \ln(X) + 3.31$ (48% Enter, 52% Exit)

Equation from Institute of Transportation Engineers' Trip Generation Manual, 9th Edition, p. 1563

Pass-By % from Institute of Transportation Engineers' Trip Generation Handbook, 3rd Edition, p. 242

² The 855.000 ksf is greater than plan being considered

FCI April 2016

Traffic Impact Analyses - Enhanced Option for the Expansion of Bal Harbour Shops Using Theoretical Development Scenarios 1 and 2

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Table 4 - TMC DATA FOR P.M. PK HR - SCENARIO 1 w/ UP TO 855,000 sf OF GLA

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	
	Feb 2014	Feb BHS	a-b B'gnd	PSCF B'gnd	Pk Sea B'gnd	PSCF B'gnd	Pk Sea B'gnd	e+g 2014 Pk Sea	B'gnd 2020	e*i B'gnd Traffic 2020	Surf- Shul Expn	Mar- riot Surf- Side	Chau- teau Ocean	Surf Club	Proj Traf Scen 1	Proj Pass- By	j+k+l+m+n+o+p+q Pk Sea 2020 W/Expn		
Intersection	Mvmt	Count	Traf	Traffic	Traffic	Traffic	Traffic	Traffic	Growth	Traffic	Con-su- latio	Surf- Side	Mar- riot Surf- Side	Chau- teau Ocean	Surf Club	Proj Traf Scen 1	Proj Pass- By		
Collins Ave & New N. Drive (2/14 count is at Bal Cross) 2/18/2014	NBUT	12	0	12	0.99	12	1.02	0	12	1.06	13	0	0	0	0	0	0	13	
	NBL	4	0	4	0.99	4	1.02	0	4	0.00	0	0	0	0	0	123	0	123	
	NBT	2,087	147	1,940	0.99	1,921	1.02	150	2,071	1.06	2,036	62	34	24	5	21	8	-45	
	NBR	4	0	4	0.99	4	1.02	0	4	1.00	4	0	0	0	0	0	0	4	
	SBUT	16	0	16	0.99	16	1.02	0	16	1.06	17	0	0	0	0	0	0	17	
	SBL	9	0	9	0.99	9	1.02	0	9	1.00	9	0	0	0	0	0	0	9	
	SBT	1,675	143	1,532	0.99	1,517	1.02	146	1,663	1.06	1,608	34	30	19	8	24	7	-35	
	SBR	3	0	3	0.99	3	1.02	0	3	0.00	0	0	0	0	0	348	0	1,695	
	EBL	0	0	0	0.99	0	1.02	0	0	0.00	0	0	0	0	0	312	0	312	
	EBR	1	0	1	0.99	1	1.02	0	1	0.00	0	0	0	0	0	173	0	173	
Collins Ave & 9700 Block 2/20/2014	NBUT	6	0	6	0.99	6	1.02	0	6	1.06	6	0	0	0	0	0	0	6	
	NBL	39	39	0	0.99	0	1.02	40	40	1.00	0	0	0	0	0	7	0	7	
	NBT	2,091	10	2,081	0.99	2,060	1.02	10	2,070	1.06	2,184	62	34	24	5	21	87	0	2,417
	NBR	52	0	52	0.99	51	1.02	0	51	1.00	51	0	0	0	0	0	0	0	51
	SBUT	0	0	0	0.99	0	1.02	0	0	1.06	0	0	0	0	0	0	0	0	
	SBL	19	0	19	0.99	19	1.02	0	19	1.00	19	0	0	0	0	0	0	19	
	SBT	1,602	4	1,598	0.99	1,582	1.02	4	1,586	1.06	1,677	34	30	19	8	24	147	0	1,939
	SBR	139	139	0	0.99	0	1.02	142	142	1.00	0	0	0	0	0	7	0	7	
	EBL	137	137	0	0.99	0	1.02	140	140	1.00	0	0	0	0	0	0	0	0	
	EBT	8	8	0	0.99	0	1.02	8	8	1.00	0	0	0	0	0	0	0	0	
Harding Ave & S BHS Dr 2/20/2014	EBr*	0	0	0	0.99	0	1.02	0	0	1.00	0	0	0	0	0	0	0	0	
	WBL	39	0	39	0.99	39	1.02	0	39	1.00	39	0	0	0	0	0	0	39	
	WBT	1	1	0	0.99	0	1.02	1	1	1.00	0	0	0	0	0	0	0	0	
	WBR	5	0	5	0.99	5	1.02	0	5	1.00	5	0	0	0	0	0	0	5	
	SBR	4	4	0	0.99	0	1.02	4	4	1.00	0	0	0	0	0	0	0	0	
Collins Ave & 96 Street 2/20/2014	EBr*	79	79	0	0.99	0	1.02	81	81	1.00	0	0	0	0	0	17	0	17	
	WBL	93	0	93	0.99	92	1.02	0	92	1.06	98	0	0	0	0	0	0	98	
	WBT	7	7	0	0.99	0	1.02	7	7	0.00	0	0	0	0	0	0	0	0	
	NBL	430	26	404	0.99	400	1.02	27	427	1.06	424	0	29	11	2	11	78	0	555
	NBT	1,817	71	1,746	0.99	1,729	1.02	72	1,801	1.06	1,833	45	34	24	5	21	78	0	2,040
	NBR	10	0	10	0.99	10	1.02	0	10	1.06	11	0	0	0	0	0	0	0	11
	EBL	377	16	361	0.99	357	1.02	16	373	1.06	378	17	0	0	0	0	8	0	408
Harding Ave & 96 Street 2/20/2014	EBT	5	0	5	0.99	5	1.02	0	5	1.06	5	0	0	0	0	0	0	5	
	WBT	9	0	9	0.99	9	1.02	0	9	1.06	10	0	0	0	0	0	0	10	
	WBR	8	0	8	0.99	8	1.02	0	8	1.06	8	0	0	0	0	0	0	8	
	SBL	22	4	18	0.99	18	1.02	4	22	1.06	19	0	26	0	0	0	8	0	53
	SBT	1,429	76	1,353	0.99	1,339	1.02	78	1,417	1.06	1,419	24	4	19	8	24	156	0	1,654
96th Street & Byron 2/20/2014	SBR	292	0	292	0.99	289	1.02	0	289	1.06	306	10	0	0	0	0	0	0	316
	EBT	389	12	377	0.99	373	1.02	12	385	1.06	395	17	25	0	0	0	0	0	437
	EBR	468	92	376	0.99	372	1.02	94	466	1.06	394	0	0	9	4	12	179	0	598
	WBT	443	26	417	0.99	413	1.02	27	440	1.06	438	0	29	11	2	11	78	0	569
	NBL	370	0	370	0.99	366	1.02	0	366	1.06	388	0	0	0	0	0	0	0	388
	NBR	52	0	52	0.99	51	1.02	0	51	1.06	54	0	0	0	0	0	0	0	54
	SBL**	--	0	0	0.99	0	1.02	0	0	1.00	0	0	0	0	0	1	0	1	
96th Street & BHS Drive 2/20/2014	SBR**	--	0	0	0.99	0	1.02	0	0	1.00	0	0	0	0	0	0	0	0	
	EBL**	0	0	0	0.99	0	1.02	0	0	1.00	0	0	0	0	0	0	0	0	
	EBT	1,044	98	946	0.99	937	1.02	100	1,037	1.06	993	17	25	9	4	12	179	0	1,239
	WBT	735	40	695	0.99	688	1.02	41	729	1.06	729	10	29	11	2	11	78	0	870
	WBR**	0	0	0	0.99	0	1.02	0	0	1.00	0	0	0	0	0	1	0	1	
	SBL	98	98	0	0.99	0	1.02	100	100	1.00	0	0	0	0	0	199	0	199	
	SBR	65	65	0	0.99	0	1.02	66	66	1.00	0	0	0	0	0	165	0	165	
96th Street & BHS Drive 2/20/2014	EBUT	6	0	6	0.99	6	1.02	0	6	1.06	6	0	0	0	0	0	0	0	6
	EBL	57	57	0	0.99	0	1.02	58	58	1.00	0	0	0	0	0	138	0	138	
	EBT	866	0	866	0.99	857	1.02	0	857	1.06	908	17	25	9	4	12	0	-20	955
	WBUT	26	0	26	0.99	26	1.02	0	26	1.06	28	0	0	0	0	0	0	0	28
	WBT	1,037	0	1,037	0.99	1,027	1.02	0	1,027	1.06	1,089	10	29	11	2	11	0	-23	1,129
	WBR	40	40	0	0.99	0	1.02	41	41	1.00	0	0	0	0	0	101	0	101	

* EB right turns at 9700 are illegal; existing R turns are transferred to drive on Harding where they are permitted

** Truck vol's into and out of the loading area bet. 5 & 6 pm are between 0 & 1; vol's are higher during midday

FCI Jan 2016

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Table 5 - TMC DATA FOR P.M. PK HR - SCENARIO 2 w/ UP TO 855,000 sf OF GLA

Intersection	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r		
		Feb 2014	Feb 2014	BHS B'gnd	PSCF B'gnd	Pk Sea B'gnd	PSCF BHS	Pk Sea BHS	e+g 2014 Pk Sea	e*i 2014 Pk Sea	B'gnd Growth	B'gnd Traffic	Con-su-latio	Surf-Side	Mar-riot Shul	Surf-Cha-teau Side	Surf-Ocean Club	Proj Traf Scen 2	Proj Pass-By	j+k+l+m+n+o+p+q Pk Sea 2020 W/Expn
	Mvmt	Count	Traf	Traffic	B'gnd	Traffic	B'gnd	Traffic	Traffic	Traffic	2020	2020	Expn	Side	Surf-Ocean	Club	Scen 2	Pass-By	W/Expn	
Collins Ave & New N. Drive (2/14 count is at Bal Cross) 2/18/2014	NBUT	12	0	12	0.99	12	1.02	0	12	1.06	13	0	0	0	0	0	0	13		
	NBL	4	0	4	0.99	4	1.02	0	4	0.00	0	0	0	0	0	206	0	206		
	NBT	2,087	147	1,940	0.99	1,921	1.02	150	2,071	1.06	2,036	62	34	24	5	21	13	-149	2,046	
	NBR	4	0	4	0.99	4	1.02	0	4	1.00	4	0	0	0	0	0	0	4		
	SBUT	16	0	16	0.99	16	1.02	0	16	1.06	17	0	0	0	0	0	0	17		
	SBL	9	0	9	0.99	9	1.02	0	9	1.00	9	0	0	0	0	0	0	9		
	SBT	1,675	143	1,532	0.99	1,517	1.02	146	1,663	1.06	1,608	34	30	19	8	24	12	-119	1,616	
	SBR	3	0	3	0.99	3	1.02	0	3	0.00	0	0	0	0	0	581	0	581		
Collins Ave & 9700 Block 2/20/2014	EBL	0	0	0	0.99	0	1.02	0	0	0.00	0	0	0	0	0	473	0	473		
	EBR	1	0	1	0.99	1	1.02	0	1	0.00	0	0	0	0	0	262	0	262		
	NBUT	6	0	6	0.99	6	1.02	0	6	1.06	6	0	0	0	0	0	0	6		
	NBL	39	39	0	0.99	0	1.02	40	40	1.00	0	0	0	0	0	12	0	12		
	NBT	2,091	10	2,081	0.99	2,060	1.02	10	2,070	1.06	2,184	62	34	24	5	21	149	0	2,479	
	NBR	52	0	52	0.99	51	1.02	0	51	1.00	51	0	0	0	0	0	0	51		
	SBUT	0	0	0	0.99	0	1.02	0	0	1.06	0	0	0	0	0	0	0	0		
	SBL	19	0	19	0.99	19	1.02	0	19	1.00	19	0	0	0	0	0	0	19		
Harding Ave & S BHS Dr 2/20/2014	SBT	1,602	4	1,598	0.99	1,582	1.02	4	1,586	1.06	1,677	34	30	19	8	24	173	0	1,965	
	SBR	139	139	0	0.99	0	1.02	142	142	1.00	0	0	0	0	0	12	0	12		
	EBL	137	137	0	0.99	0	1.02	140	140	1.00	0	0	0	0	0	0	0	0		
	EBT	8	8	0	0.99	0	1.02	8	8	1.00	0	0	0	0	0	0	0	0		
	EBR*	0	0	0	0.99	0	1.02	0	0	1.00	0	0	0	0	0	0	0	0		
	WBL	39	0	39	0.99	39	1.02	0	39	1.00	39	0	0	0	0	0	0	39		
	WBT	1	1	0	0.99	0	1.02	1	1	1.00	0	0	0	0	0	0	0	0		
	WBR	5	0	5	0.99	5	1.02	0	5	1.00	5	0	0	0	0	0	0	5		
Collins Ave & 96 Street 2/20/2014	SBR	4	4	0	0.99	0	1.02	4	4	1.00	0	0	0	0	0	0	0	0		
	EBR*	79	79	0	0.99	0	1.02	81	81	1.00	0	0	0	0	0	26	0	26		
	WBL	93	0	93	0.99	92	1.02	0	92	1.06	98	0	0	0	0	0	0	98		
	WBT	7	7	0	0.99	0	1.02	7	7	0.00	0	0	0	0	0	0	0	0		
	NBL	430	26	404	0.99	400	1.02	27	427	1.06	424	0	29	11	2	11	112	0	589	
	NBT	1,817	71	1,746	0.99	1,729	1.02	72	1,801	1.06	1,833	45	34	24	5	21	148	0	2,110	
	NBR	10	0	10	0.99	10	1.02	0	10	1.06	11	0	0	0	0	0	0	11		
	EBL	377	16	361	0.99	357	1.02	16	373	1.06	378	17	0	0	0	0	13	0	408	
Harding Ave & 96 Street 2/20/2014	EBT	5	0	5	0.99	5	1.02	0	5	1.06	5	0	0	0	0	0	0	5		
	WBT	9	0	9	0.99	9	1.02	0	9	1.06	10	0	0	0	0	0	0	10		
	WBR	8	0	8	0.99	8	1.02	0	8	1.06	8	0	0	0	0	0	0	8		
	SBL	22	4	18	0.99	18	1.02	4	22	1.06	19	0	26	0	0	0	13	0	58	
	SBT	1,429	76	1,353	0.99	1,339	1.02	78	1,417	1.06	1,419	24	4	19	8	24	186	0	1,684	
	SBR	292	0	292	0.99	289	1.02	0	289	1.06	306	10	0	0	0	0	0	0	316	
	EBT	389	12	377	0.99	373	1.02	12	385	1.06	395	17	25	0	0	0	0	0	437	
	EBR	468	92	376	0.99	372	1.02	94	466	1.06	394	0	0	9	4	12	199	0	618	
96th Street & Byron 2/20/2014	WBT	443	26	417	0.99	413	1.02	27	440	1.06	438	0	29	11	2	11	112	0	603	
	NBL	370	0	370	0.99	366	1.02	0	366	1.06	388	0	0	0	0	0	0	0	388	
	NBR	52	0	52	0.99	51	1.02	0	51	1.06	54	0	0	0	0	0	0	0	54	
	SBL**	--	0	0	0.99	0	1.02	0	0	1.00	0	0	0	0	0	1	0	1		
	SBR**	--	0	0	0.99	0	1.02	0	0	1.00	0	0	0	0	0	0	0	0		
	EBL**	--	0	0	0.99	0	1.02	0	0	1.00	0	0	0	0	0	0	0	0		
	EBT	1,044	98	946	0.99	937	1.02	100	1,037	1.06	993	17	25	9	4	12	199	0	1,259	
	WBT	735	40	695	0.99	688	1.02	41	729	1.06	729	10	29	11	2	11	112	0	904	
96th Street & BHS Drive 2/20/2014	WBR**	0	0	0	0.99	0	1.02	0	0	1.00	0	0	0	0	0	1	0	1		
	SBL	98	98	0	0.99	0	1.02	100	100	1.00	0	0	0	0	0	302	0	302		
	SBR	65	65	0	0.99	0	1.02	66	66	1.00	0	0	0	0	0	249	0	249		
	EBUT	6	0	6	0.99	6	1.02	0	6	1.06	6	0	0	0	0	0	0	6		
	EBL	57	57	0	0.99	0	1.02	58	58	1.00	0	0	0	0	0	230	0	230		
	EBT	866	0	866	0.99	857	1.02	0	857	1.06	908	17	25	9	4	12	0	-66	909	
	WBUT	26	0	26	0.99	26	1.02	0	26	1.06	28	0	0	0	0	0	0	28		
	WBT	1,037	0	1,037	0.99	1,027	1.02	0	1,027	1.06	1,089	10	29	11	2	11	0	-78	1,074	
	WBR	40	40	0	0.99	0	1.02	41	41	1.00	0	0	0	0	0	170	0	170		

* EB right turns at 9700 are illegal; existing R turns are transferred to drive on Harding where they are permitted

** Truck vol's into and out of the loading area bet. 5 & 6 pm are between 0 & 1; vol's are higher during midday

Traffic Impact Analyses - Enhanced Option for the Expansion of Bal Harbour Shops
 Using Theoretical Development Scenarios 1 and 2
 January 9, 2017

Table 6 - INTERSECTION LOS w/ UP TO 855,000 SF OF GLA

Location	Existing Peak Season	PM Peak Hour		
		2020 Pk Season per FCI	2020 Pk Season Scenario 1	2020 Pk Season Scenario 2
Collins Ave & New North Dr	--	A/8.1	B/12.5	C/22.1
Collins Ave & 9700 Block	C/28.5	A/6.0	A/6.2	A/6.3
Collins Avenue & 96th St	D/35.0	B/17.1	B/17.3	B/17.3
Harding Avenue & 96th St	D/37.2	C/27.5	D/37.4**	D/38.0***
96th Street & Byron Avenue	A/6.5	B/12.0	B/12.0	B/14.8
96th Street & S. Entrance	A/6.7	A/8.1	B/13.4	B/15.5

* LOS/Ave. delay in sec. based on Synchro optimization; **C/28.2 and ***C/28.5 w/Offset Adjustment at Byron

FCI Jan 2016

Traffic Impact Analyses - Enhanced Option for the Expansion of Bal Harbour Shops
 Using Theoretical Development Scenarios 1 and 2
 January 9, 2017

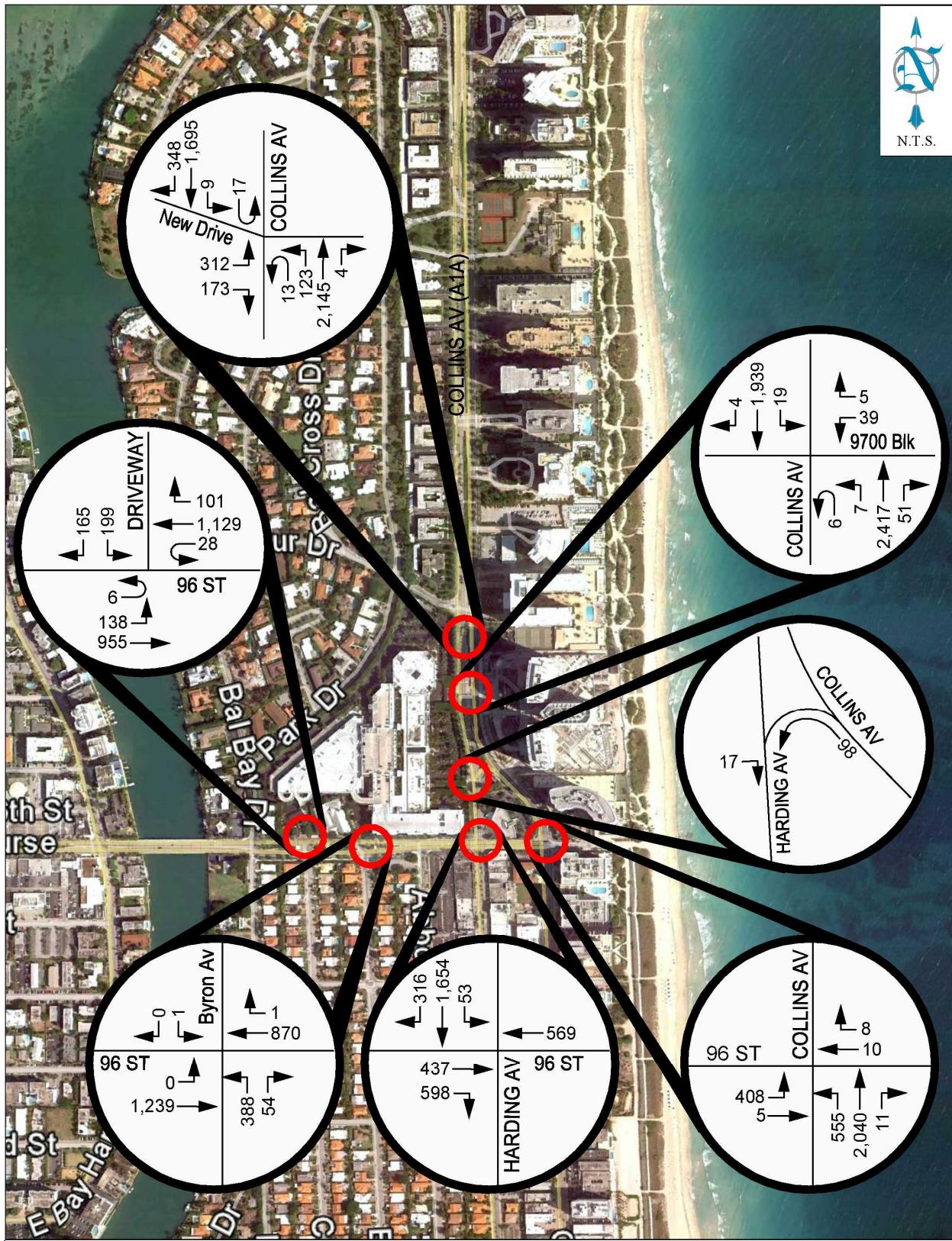


Figure 1 - 2020 PK SEASON TRAFFIC (5-6 PM) w/ UP TO 855 KSF OF GLA - SCENARIO 1

Traffic Impact Analyses - Enhanced Option for the Expansion of Bal Harbour Shops
 Using Theoretical Development Scenarios 1 and 2
 January 9, 2017

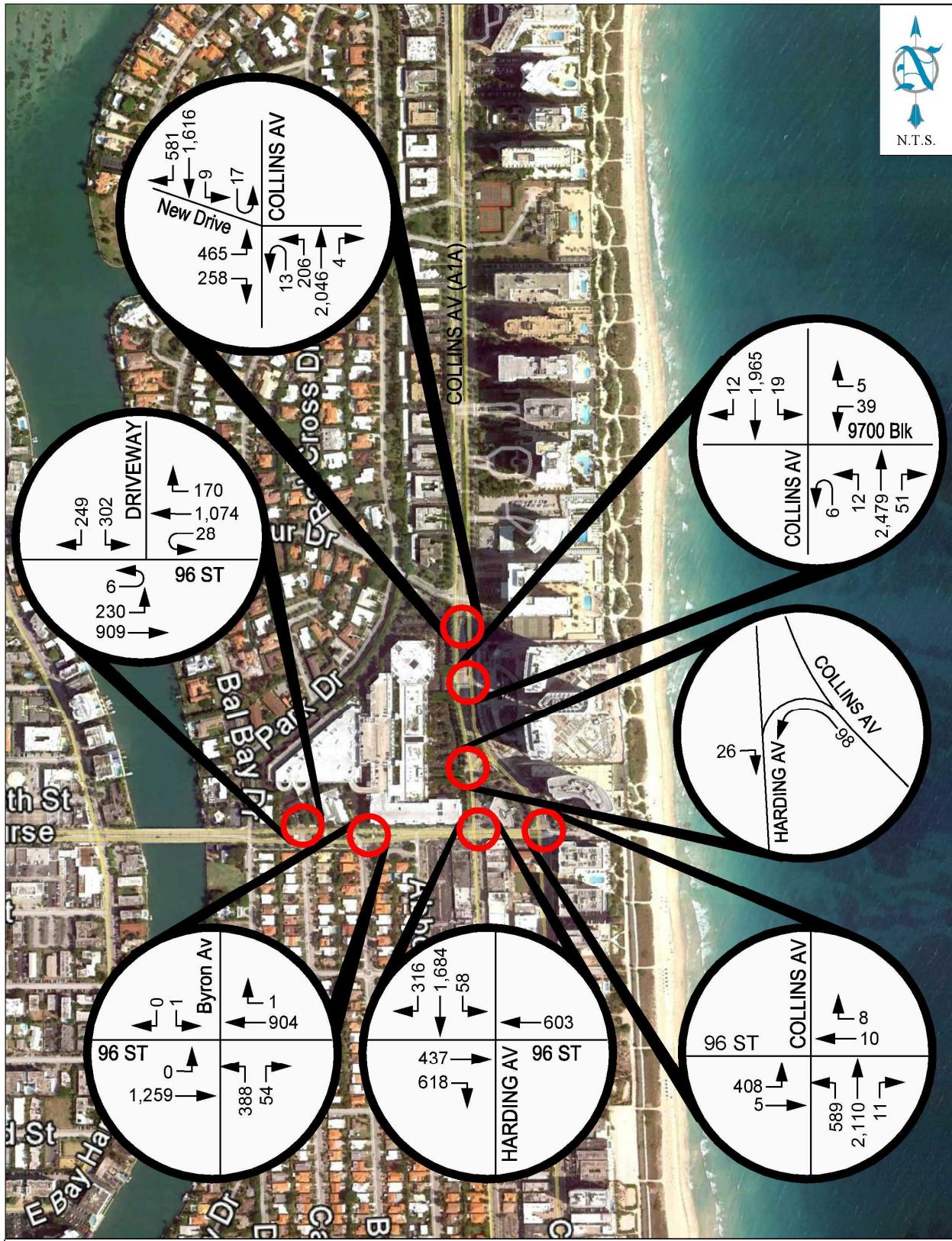


Figure 2 - 2020 PK SEASON TRAFFIC (5-6 PM) w/ UP TO 855 KSF OF GLA - SCENARIO 2

CAPACITY ANALYSES

Existing

3548: Harding Ave/Collins Ave & 9700 Blk/9701 Blk
Lanes, Volumes, Timings

2014 Peak Season
PM Peak - 2014 Peak Season

	↑	→	↓	↗	↖	↙	↖	↑	↗	↙	↓	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↓		↑	↓	↑↑	↑↑	↑↑↑		↑↑	↑↑↑	
Volume (vph)	140	8	0	38	1	5	40	2070	51	19	1586	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	140		0
Storage Lanes	2		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		423			324			378			391	
Travel Time (s)		9.6			7.4			8.6			8.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Shared Lane Traffic (%)	30%			49%								
Turn Type	Split	NA		Split	NA	Prot	pm+pt	NA		pm+pt	NA	
Protected Phases	8	8		4	4	4	5	2		1	6	
Permitted Phases							2			6	6	
Detector Phase	8	8		4	4	4	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		4.0	4.0	4.0	4.0	4.0		4.8	4.0	
Minimum Split (s)	13.8	13.8		15.0	15.0	15.0	10.2	20.0		11.0	21.0	
Total Split (s)	41.0	41.0		20.0	20.0	20.0	12.0	77.0		12.0	77.0	
Total Split (%)	27.3%	27.3%		13.3%	13.3%	13.3%	8.0%	51.3%		8.0%	51.3%	
Maximum Green (s)	34.2	34.2		13.2	13.2	13.2	5.8	70.5		5.8	70.5	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.7	4.0		3.7	4.0	
All-Red Time (s)	2.8	2.8		2.8	2.8	2.8	2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0	0.0	0.0	0.0		1.0	-1.0	
Total Lost Time (s)	5.8	5.8		5.8	5.8	6.2	6.2	6.5		7.2	5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.0	2.0			2.0	2.0	
Recall Mode	Max	Max		None	None	None	C-Max			None	C-Max	
Walk Time (s)	4.0	4.0										
Flash Dont Walk (s)	29.0	29.0										
Pedestrian Calls (#/hr)	24	24										

Intersection Summary

Area Type: Other

Cycle Length: 150

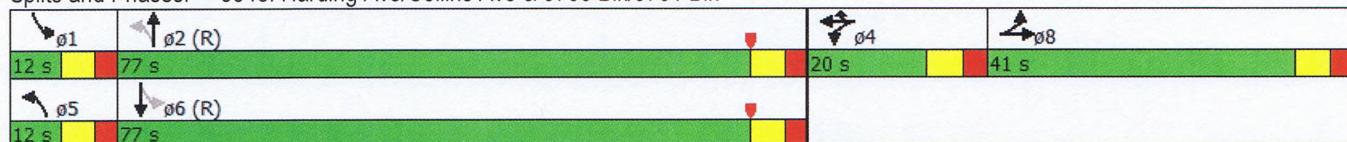
Actuated Cycle Length: 150

Offset: 75 (50%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 3548: Harding Ave/Collins Ave & 9700 Blk/9701 Blk



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑		↑	↑	↑	↑↑	↑↑↑		↑	↑↑↑	
Volume (veh/h)	140	8	0	38	1	5	40	2070	51	19	1586	142
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	0	1900	1900	1900	1900	1864	1900	1900	1866	1900
Adj Flow Rate, veh/h	153	0	0	41	0	5	42	2179	54	20	1669	149
Adj No. of Lanes	3	1	0	2	0	1	1	3	0	1	3	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	2	2	0	2	2
Cap, veh/h	1274	446	0	106	0	47	170	2839	70	106	2660	237
Arrive On Green	0.23	0.00	0.00	0.03	0.00	0.03	0.02	0.56	0.56	0.01	0.56	0.55
Sat Flow, veh/h	5429	1900	0	3619	0	1615	1810	5107	126	1810	4762	424
Grp Volume(v), veh/h	153	0	0	41	0	5	42	1446	787	20	1189	629
Grp Sat Flow(s), veh/h/ln	1810	1900	0	1810	0	1615	1810	1696	1841	1810	1698	1791
Q Serve(g_s), s	3.3	0.0	0.0	1.7	0.0	0.5	1.5	49.5	49.8	0.7	35.7	35.9
Cycle Q Clear(g_c), s	3.3	0.0	0.0	1.7	0.0	0.5	1.5	49.5	49.8	0.7	35.7	35.9
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.07	1.00		0.24
Lane Grp Cap(c), veh/h	1274	446	0	106	0	47	170	1885	1023	106	1897	1000
V/C Ratio(X)	0.12	0.00	0.00	0.39	0.00	0.11	0.25	0.77	0.77	0.19	0.63	0.63
Avail Cap(c_a), veh/h	1274	446	0	343	0	153	200	1885	1023	144	1897	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	0.0	0.0	71.5	0.0	70.9	19.1	25.8	25.9	24.0	22.5	22.6
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.7	0.0	0.7	0.3	3.1	5.6	0.3	1.6	3.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln	1.7	0.0	0.0	0.9	0.0	0.2	0.8	23.9	26.7	0.4	17.1	18.5
LnGrp Delay(d), s/veh	45.4	0.0	0.0	73.2	0.0	71.6	19.3	28.8	31.4	24.3	24.1	25.6
LnGrp LOS	D			E		E	B	C	C	C	C	C
Approach Vol, veh/h		153			46			2275			1838	
Approach Delay, s/veh		45.4			73.0			29.6			24.6	
Approach LOS		D			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.9	89.9		10.2	9.5	89.3		41.0				
Change Period (Y+Rc), s	* 6.2	6.5		* 6.8	* 6.2	6.5		6.8				
Max Green Setting (Gmax), s	* 5.8	70.5		* 13	* 5.8	70.5		34.2				
Max Q Clear Time (g_c+1), s	2.7	51.8		3.7	3.5	37.9		5.3				
Green Ext Time (p_c), s	0.0	13.9		0.0	0.0	20.4		0.5				

Intersection Summary

HCM 2010 Ctrl Delay 28.5
HCM 2010 LOS C

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

3005: Collins Ave & 96th St
Lanes, Volumes, Timings

2014 Peak Season
PM Peak without Change at BHS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	4	1	1	1	1	1	1	1	1	1	1
Volume (vph)	373	5	0	0	9	8	427	1801	10	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	300	0	0	0	0	0	0
Storage Lanes	1	0	0	0	0	1	0	0	0	0	0	0
Taper Length (ft)	25			25			50			25		
Right Turn on Red		Yes			Yes			Yes			Yes	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		297			368			670			418	
Travel Time (s)		6.8			8.4			15.2			9.5	
Peak Hour Factor	0.96	0.96	0.96	0.95	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	1%	1%	0%	0%	2%	2%	0%	2%	2%	2%
Shared Lane Traffic (%)	49%											
Turn Type	Split	NA			NA		Prot	NA				
Protected Phases	4	4			8		5	2				
Permitted Phases												
Detector Phase	4	4			8		5	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0			7.0		4.0	4.0				
Minimum Split (s)	25.0	25.0			13.2		24.0	31.0				
Total Split (s)	63.0	63.0			15.0		55.0	72.0				
Total Split (%)	42.0%	42.0%			10.0%		36.7%	48.0%				
Maximum Green (s)	56.8	56.8			8.8		48.1	65.1				
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0				
All-Red Time (s)	2.2	2.2			2.2		2.9	2.9				
Lost Time Adjust (s)	-1.0	-1.0			-1.0		-1.0	-1.0				
Total Lost Time (s)	5.2	5.2			5.2		5.9	5.9				
Lead/Lag							Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5			2.5		2.0	2.0				
Recall Mode	Max	Max			None		Max	C-Max				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												

Intersection Summary

Area Type: Other

Cycle Length: 150

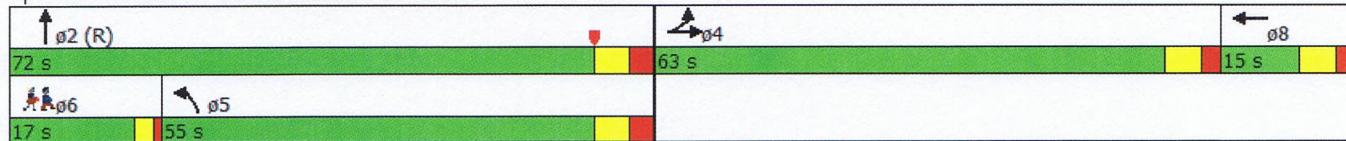
Actuated Cycle Length: 150

Offset: 113 (75%), Referenced to phase 2:NBT, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 3005: Collins Ave & 96th St



Lane Group	ø6
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Turn Type	
Protected Phases	6
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	16.0
Total Split (s)	17.0
Total Split (%)	11%
Maximum Green (s)	14.0
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Recall Mode	Ped
Walk Time (s)	4.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	8

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑			↑		↑	↑↑↑				
Volume (veh/h)	373	5	0	0	9	8	427	1801	10	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1864	0	0	1900	1900	1863	1863	1900			
Adj Flow Rate, veh/h	393	0	0	0	9	8	445	1876	10			
Adj No. of Lanes	2	1	0	0	1	0	1	3	0			
Peak Hour Factor	0.96	0.96	0.96	0.95	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	0	0	0	0	0	2	2	2			
Cap, veh/h	1367	718	0	0	28	25	844	2483	13			
Arrive On Green	0.39	0.00	0.00	0.00	0.03	0.02	0.48	0.48	0.47			
Sat Flow, veh/h	3548	1864	0	0	929	826	1774	5221	28			
Grp Volume(v), veh/h	393	0	0	0	0	17	445	1218	668			
Grp Sat Flow(s), veh/h/ln	1774	1864	0	0	0	1754	1774	1695	1858			
Q Serve(g_s), s	11.5	0.0	0.0	0.0	0.0	1.4	26.3	44.1	44.1			
Cycle Q Clear(g_c), s	11.5	0.0	0.0	0.0	0.0	1.4	26.3	44.1	44.1			
Prop In Lane	1.00		0.00	0.00		0.47	1.00			0.01		
Lane Grp Cap(c), veh/h	1367	718	0	0	0	53	844	1613	884			
V/C Ratio(X)	0.29	0.00	0.00	0.00	0.00	0.32	0.53	0.76	0.76			
Avail Cap(c_a), veh/h	1367	718	0	0	0	115	844	1613	884			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(l)	0.67	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	31.9	0.0	0.0	0.0	0.0	71.4	27.5	32.2	32.2			
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.0	0.0	2.5	2.4	3.3	6.0			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(-26165%), veh/ln	5.7	0.0	0.0	0.0	0.0	0.7	13.4	21.4	24.1			
LnGrp Delay(d), s/veh	32.2	0.0	0.0	0.0	0.0	74.0	29.9	35.5	38.2			
LnGrp LOS	C					E	C	D	D			
Approach Vol, veh/h	393				17			2331				
Approach Delay, s/veh	32.2				74.0			35.2				
Approach LOS	C				E			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2			4				8				
Phs Duration (G+Y+Rc), s	77.2			63.0				9.8				
Change Period (Y+Rc), s	6.9		* 6.2					6.2				
Max Green Setting (Gmax), s	48.1		* 57					8.8				
Max Q Clear Time (g_c+1), s	46.1		13.5					3.4				
Green Ext Time (p_c), s	1.5		1.5					0.0				

Intersection Summary

HCM 2010 Ctrl Delay 35.0
HCM 2010 LOS D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

2919: Harding Ave & 96th St
Lanes, Volumes, Timings

2014 Peak Season
Existing PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑↑					↑↑↑	↑↑	↑
Volume (vph)	0	385	466	0	440	0	0	0	0	22	1417	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red		No				Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		278			297			669			261	
Travel Time (s)		6.3			6.8			15.2			5.9	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	2%	2%	1%	2%	1%	1%	1%	1%	1%	2%	1%
Shared Lane Traffic (%)					15%							
Turn Type		NA	Perm		NA					Perm	NA	Perm
Protected Phases		4			8						6	
Permitted Phases				4							6	
Detector Phase		4	4		8					6	6	6
Switch Phase												
Minimum Initial (s)		4.0	4.0		4.0					4.0	4.0	4.0
Minimum Split (s)		24.0	24.0		25.0					72.3	72.3	72.3
Total Split (s)		69.0	69.0		69.0					81.0	81.0	81.0
Total Split (%)		46.0%	46.0%		46.0%					54.0%	54.0%	54.0%
Maximum Green (s)		62.7	62.7		63.0					74.7	74.7	74.7
Yellow Time (s)		4.0	4.0		4.0					4.0	4.0	4.0
All-Red Time (s)		2.3	2.3		2.0					2.3	2.3	2.3
Lost Time Adjust (s)		-1.0	-1.0		-1.0					-1.0	-1.0	-1.0
Total Lost Time (s)		5.3	5.3		5.0					5.3	5.3	5.3
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		1.0	1.0		1.0					1.0	1.0	1.0
Recall Mode		Max	Max		Max					C-Max	C-Max	C-Max
Walk Time (s)					7.0					49.0	49.0	49.0
Flash Dont Walk (s)					12.0					17.0	17.0	17.0
Pedestrian Calls (#/hr)					0					0	0	0

Intersection Summary

Area Type: Other

Cycle Length: 150

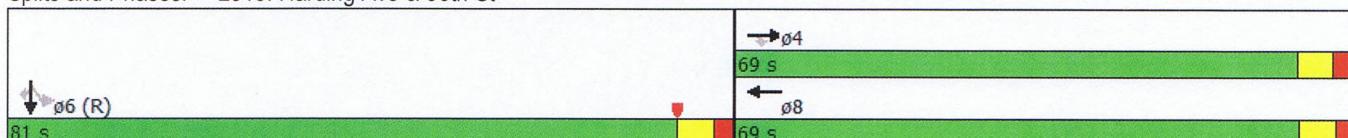
Actuated Cycle Length: 150

Offset: 98 (65%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Splits and Phases: 2919: Harding Ave & 96th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	385	466	0	440	0	0	0	0	22	1417	289
Number	7	4	14	3	8	18				1	6	16
Initial Q (Q _b), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	0	1863	0				1900	1863	1881
Adj Flow Rate, veh/h	0	474	453	0	468	0				23	1507	307
Adj No. of Lanes	0	1	1	0	2	0				0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	2	2	0	2	0				1	2	1
Cap, veh/h	0	795	676	0	1510	0				38	2612	807
Arrive On Green	0.00	0.71	0.71	0.00	0.43	0.00				0.17	0.17	0.17
Sat Flow, veh/h	0	1863	1583	0	3725	0				74	5176	1599
Grp Volume(v), veh/h	0	474	453	0	468	0				575	955	307
Grp Sat Flow(s), veh/h/ln	0	1863	1583	0	1770	0				1859	1695	1599
Q Serve(g_s), s	0.0	19.1	23.6	0.0	13.1	0.0				43.1	38.8	25.6
Cycle Q Clear(g_c), s	0.0	19.1	23.6	0.0	13.1	0.0				43.1	38.8	25.6
Prop In Lane	0.00		1.00	0.00		0.00				0.04		1.00
Lane Grp Cap(c), veh/h	0	795	676	0	1510	0				938	1711	807
V/C Ratio(X)	0.00	0.60	0.67	0.00	0.31	0.00				0.61	0.56	0.38
Avail Cap(c_a), veh/h	0	795	676	0	1510	0				938	1711	807
HCM Platoon Ratio	1.00	1.67	1.67	1.00	1.00	1.00				0.33	0.33	0.33
Upstream Filter(l)	0.00	1.00	1.00	0.00	0.86	0.00				0.94	0.94	0.94
Uniform Delay (d), s/veh	0.0	15.1	15.8	0.0	28.4	0.0				48.9	47.1	41.6
Incr Delay (d2), s/veh	0.0	3.3	5.2	0.0	0.5	0.0				2.8	1.2	1.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln	0.0	10.4	11.0	0.0	6.5	0.0				23.0	18.6	11.6
LnGrp Delay(d), s/veh	0.0	18.4	21.0	0.0	28.9	0.0				51.7	48.4	42.9
LnGrp LOS		B	C		C					D	D	D
Approach Vol, veh/h		927			468						1837	
Approach Delay, s/veh		19.7			28.9						48.5	
Approach LOS		B			C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+R _c), s					69.3	81.0	69.3					
Change Period (Y+R _c), s				* 6.3		6.3	* 6.3					
Max Green Setting (Gmax), s				* 63		74.7	* 63					
Max Q Clear Time (g_c+1), s				25.6		45.1	15.1					
Green Ext Time (p_c), s					1.6	2.3	1.6					

Intersection Summary

HCM 2010 Ctrl Delay 37.4
HCM 2010 LOS D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖↖	↗↗
Volume (vph)	1037	0	0	729	366	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Right Turn on Red	Yes					Yes
Link Speed (mph)	30			30	30	
Link Distance (ft)	282			279	570	
Travel Time (s)	6.4			6.3	13.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	0%	2%	1%	0%
Shared Lane Traffic (%)						
Turn Type	NA			NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases						8
Detector Phase	2			6	8	8
Switch Phase						
Minimum Initial (s)	4.0			4.0	4.0	4.0
Minimum Split (s)	22.5			22.5	12.0	12.0
Total Split (s)	41.0			41.0	34.0	34.0
Total Split (%)	54.7%			54.7%	45.3%	45.3%
Maximum Green (s)	34.5			34.5	28.0	28.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.5			2.5	2.0	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.5			6.5	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	1.0			1.0	2.5	2.5
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	5.0			5.0		
Flash Dont Walk (s)	11.0			11.0		
Pedestrian Calls (#/hr)	0			0		

Intersection Summary

Area Type: Other

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 6 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow

Natural Cycle: 40

Control Type: Actuated-Coordinated

Splits and Phases: 3648: Byron & 96th St



Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑			↑↑	↑↑	↑		
Volume (veh/h)	1037	0	0	729	366	51		
Number	2	12	1	6	3	18		
Initial Q (Q _b), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	0	0	1863	1881	1900		
Adj Flow Rate, veh/h	1080	0	0	759	381	53		
Adj No. of Lanes	2	0	0	2	2	1		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96		
Percent Heavy Veh, %	2	0	0	2	1	0		
Cap, veh/h	2432	0	0	2432	508	236		
Arrive On Green	1.00	0.00	0.00	1.00	0.15	0.15		
Sat Flow, veh/h	3725	0	0	3725	3476	1615		
Grp Volume(v), veh/h	1080	0	0	759	381	53		
Grp Sat Flow(s), veh/h/ln	1770	0	0	1770	1738	1615		
Q Serve(g_s), s	0.0	0.0	0.0	0.0	7.9	2.2		
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	7.9	2.2		
Prop In Lane		0.00	0.00		1.00	1.00		
Lane Grp Cap(c), veh/h	2432	0	0	2432	508	236		
V/C Ratio(X)	0.44	0.00	0.00	0.31	0.75	0.22		
Avail Cap(c_a), veh/h	2432	0	0	2432	1298	603		
HCM Platoon Ratio	2.00	1.00	1.00	2.00	1.00	1.00		
Upstream Filter(l)	0.95	0.00	0.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	30.7	28.3		
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.3	1.7	0.4		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(-26165%), veh/ln	0.2	0.0	0.0	0.1	3.9	1.0		
LnGrp Delay(d), s/veh	0.6	0.0	0.0	0.3	32.4	28.6		
LnGrp LOS	A			A	C	C		
Approach Vol, veh/h	1080			759	434			
Approach Delay, s/veh	0.6			0.3	31.9			
Approach LOS	A			A	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+R _c), s	58.0				58.0		17.0	
Change Period (Y+R _c), s	6.5				6.5		6.0	
Max Green Setting (Gmax), s	34.5				34.5		28.0	
Max Q Clear Time (g_c+11), s	2.0				2.0		9.9	
Green Ext Time (p_c), s	1.7				1.7		1.1	
Intersection Summary								
HCM 2010 Ctrl Delay			6.5					
HCM 2010 LOS			A					

4344: 96th St & BHS South
Lanes, Volumes, Timings

2014 Peak Season
Existing PM Peak Hour

Lane Group	EBU	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations								
Volume (vph)	6	58	857	26	1027	41	100	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		85		25		0	0	0
Storage Lanes		1		1		0	2	1
Taper Length (ft)		50		25			25	
Right Turn on Red						Yes		Yes
Link Speed (mph)				30		30		30
Link Distance (ft)				244		282		588
Travel Time (s)				5.5		6.4		13.4
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	0%	2%	1%	2%	0%	0%	0%
Shared Lane Traffic (%)								22%
Turn Type	pm+pt	pm+pt	NA	Perm	NA		Prot	Prot
Protected Phases	5	5	2		6		4	4
Permitted Phases	2	2		6				
Detector Phase	5	5	2	6	6		4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	9.0	9.0	22.0	22.0	22.0		21.0	21.0
Total Split (s)	8.0	8.0	112.0	104.0	104.0		38.0	38.0
Total Split (%)	5.3%	5.3%	74.7%	69.3%	69.3%		25.3%	25.3%
Maximum Green (s)	4.3	4.3	106.0	98.0	98.0		32.0	32.0
Yellow Time (s)	3.7	3.7	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	0.0	0.0	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)			0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)			3.7	6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lead		Lag	Lag			
Lead-Lag Optimize?								
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0
Recall Mode	None	None	C-Max	C-Max	C-Max		None	None
Walk Time (s)			5.0	5.0	5.0			
Flash Dont Walk (s)			11.0	11.0	11.0			
Pedestrian Calls (#/hr)			0	0	0			

Intersection Summary

Area Type: Other

Cycle Length: 150

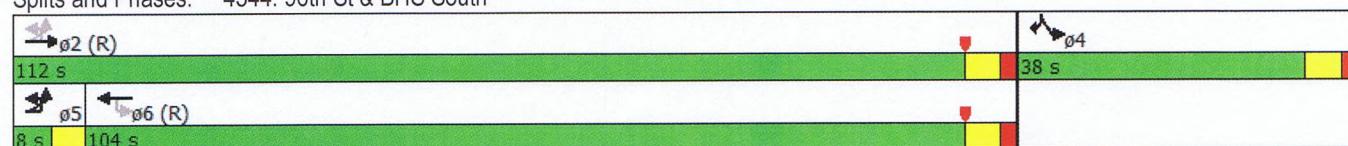
Actuated Cycle Length: 150

Offset: 149 (99%), Referenced to phase 2:EBTL and 6:WBTU, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 4344: 96th St & BHS South



4344: 96th St & BHS South
HCM 2010 Signalized Intersection Summary

2014 Peak Season
Existing PM Peak Hour

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations								
Volume (veh/h)	6	58	857	26	1027	41	100	66
Number		5	2		6	16	7	14
Initial Q (Q _b), veh		0	0		0	0	0	0
Ped-Bike Adj(A_pbT)		1.00				1.00	1.00	1.00
Parking Bus, Adj		1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1898	1863		1864	1900	1900	1900
Adj Flow Rate, veh/h		62	912		1093	44	117	59
Adj No. of Lanes		1	2		2	0	2	1
Peak Hour Factor		0.94	0.94		0.94	0.94	0.94	0.94
Percent Heavy Veh, %		0	2		2	2	0	0
Cap, veh/h		504	3075		2844	114	185	83
Arrive On Green		0.02	0.87		1.00	1.00	0.05	0.05
Sat Flow, veh/h		1808	3632		3564	140	3619	1615
Grp Volume(v), veh/h		62	912		558	579	117	59
Grp Sat Flow(s), veh/h/ln		1808	1770		1771	1840	1810	1615
Q Serve(g_s), s		0.8	6.8		0.0	0.0	4.8	5.4
Cycle Q Clear(g_c), s		0.8	6.8		0.0	0.0	4.8	5.4
Prop In Lane		1.00				0.08	1.00	1.00
Lane Grp Cap(c), veh/h		504	3075		1451	1507	185	83
V/C Ratio(X)		0.12	0.30		0.38	0.38	0.63	0.71
Avail Cap(c_a), veh/h		511	3075		1451	1507	772	345
HCM Platoon Ratio		1.00	1.00		2.00	2.00	1.00	1.00
Upstream Filter(l)		1.00	1.00		0.90	0.90	1.00	1.00
Uniform Delay (d), s/veh		1.6	1.7		0.0	0.0	69.8	70.1
Incr Delay (d2), s/veh		0.0	0.2		0.7	0.7	1.3	4.2
Initial Q Delay(d3), s/veh		0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln		0.4	3.4		0.3	0.3	2.4	4.9
LnGrp Delay(d), s/veh		1.6	2.0		0.7	0.7	71.1	74.3
LnGrp LOS		A	A		A	A	E	E
Approach Vol, veh/h			974		1137		176	
Approach Delay, s/veh			2.0		0.7		72.2	
Approach LOS			A		A		E	
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+R _c), s		136.3		13.7	7.4	128.9		
Change Period (Y+R _c), s		6.0		6.0	3.7	6.0		
Max Green Setting (Gmax), s		106.0		32.0	4.3	98.0		
Max Q Clear Time (g_c+I1), s		8.8		7.4	2.8	2.0		
Green Ext Time (p_c), s		4.8		0.3	0.0	4.8		
Intersection Summary								
HCM 2010 Ctrl Delay			6.7					
HCM 2010 LOS			A					
Notes								
User approved volume balancing among the lanes for turning movement.								
User approved ignoring U-Turning movement.								

Enhanced Option (855 ksf)

5: Collins Ave & N Drive/Condo Dr
Timings

2020 Pk Sea w- Enhanced Plan w/ 855KSF
BHS Expansion with Optimized Network

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑		↑↑				↑↑	↑↑↑↑		↑↑	↑↑↑↑	
Volume (vph)	207	0	115	0	0	0	88	2187	4	26	1729	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)									0%			
Storage Length (ft)	0		0	0		0	200		0	100		0
Storage Lanes	2		1	0		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		122			209			297			1786	
Travel Time (s)		2.8			4.8			6.8			40.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Turn Type	Prot		pm+ov				pm+pt	NA		pm+pt	NA	
Protected Phases	7		5				5	2		1	6	
Permitted Phases			7				2			6		
Detector Phase	7		5				5	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0		4.0				4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0		9.0				9.0	20.0		18.0	20.0	
Total Split (s)	24.0		19.0				19.0	108.0		18.0	107.0	
Total Split (%)	16.0%		12.7%				12.7%	72.0%		12.0%	71.3%	
Yellow Time (s)	4.0		4.0				4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0		1.0				1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0		0.0				0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0		5.0				5.0	5.0		5.0	5.0	
Lead/Lag			Lead				Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None		None				None	C-Max		Max	C-Max	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 3 (2%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 5: Collins Ave & N Drive/Condo Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑		↑				↑	↑↑↑		↑	↑↑↑	
Volume (veh/h)	207	0	115	0	0	0	88	2187	4	26	1729	211
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900				1900	1863	1900	1900	1867	1900
Adj Flow Rate, veh/h	223	0	124				95	2352	4	28	1859	227
Adj No. of Lanes	2	0	1				1	3	0	1	3	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	2	2	0	2	2
Cap, veh/h	351	0	207				223	3740	6	315	3556	431
Arrive On Green	0.10	0.00	0.10				0.06	1.00	1.00	0.09	0.77	0.77
Sat Flow, veh/h	3510	0	1615				1810	5243	9	1810	4607	559
Grp Volume(v), veh/h	223	0	124				95	1521	835	28	1367	719
Grp Sat Flow(s),veh/h/ln	1755	0	1615				1810	1695	1861	1810	1699	1768
Q Serve(g_s), s	9.2	0.0	10.9				2.2	0.0	0.0	0.4	23.0	23.4
Cycle Q Clear(g_c), s	9.2	0.0	10.9				2.2	0.0	0.0	0.4	23.0	23.4
Prop In Lane	1.00		1.00				1.00		0.00	1.00		0.32
Lane Grp Cap(c), veh/h	351	0	207				223	2418	1328	315	2623	1365
V/C Ratio(X)	0.64	0.00	0.60				0.43	0.63	0.63	0.09	0.52	0.53
Avail Cap(c_a), veh/h	445	0	250				341	2418	1328	315	2623	1365
HCM Platoon Ratio	1.00	1.00	1.00				2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.21	0.21	0.21	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.9	0.0	61.8				6.4	0.0	0.0	2.7	6.5	6.6
Incr Delay (d2), s/veh	0.7	0.0	1.0				0.1	0.3	0.5	0.6	0.7	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	4.5	0.0	9.7				1.0	0.1	0.2	0.3	10.9	11.9
LnGrp Delay(d),s/veh	65.6	0.0	62.8				6.5	0.3	0.5	3.2	7.3	8.0
LnGrp LOS	E		E				A	A	A	A	A	A
Approach Vol, veh/h	347							2451			2114	
Approach Delay, s/veh	64.6							0.6			7.5	
Approach LOS	E							A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		
Phs Duration (G+Y+Rc), s	18.0	112.0		20.0	9.2	120.8		
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0		
Max Green Setting (Gmax), s	13.0	103.0		19.0	14.0	102.0		
Max Q Clear Time (g_c+1), s	2.4	2.0		12.9	4.2	25.4		
Green Ext Time (p_c), s	0.0	77.8		0.4	0.1	62.6		

Intersection Summary

HCM 2010 Ctrl Delay	8.1
HCM 2010 LOS	A

Notes

User approved ignoring U-Turning movement.

3548: Harding Ave/Collins Ave & 9700 Blk/9701 Blk 2020 Pk Sea -Enhanced Plan 835 KSF
 Timings BHS Expansion with Optimized Network

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↖	↗	↖	↑↑	↑↑	↖	↑↑↑	
Volume (vph)	0	0	0	39	0	5	10	2410	51	19	1909	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)					0%			0%			0%	
Storage Length (ft)	0					0	100			0	125	
Storage Lanes	0					1	1			0	1	
Taper Length (ft)	25			25			25			50		
Right Turn on Red			Yes				Yes			Yes		Yes
Link Speed (mph)		30				30			30			30
Link Distance (ft)		149				204			380			297
Travel Time (s)		3.4				4.6			8.6			6.8
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%			0%		0%	
Shared Lane Traffic (%)			50%									
Turn Type			Split	NA	Perm	pm+pt	NA		pm+pt	NA		
Protected Phases			4	4		5	2			1	6	
Permitted Phases					4	2				6	6	
Detector Phase			4	4	4	5	2			1	6	
Switch Phase												
Minimum Initial (s)			15.0	15.0	15.0	4.0	4.0			5.0	4.0	
Minimum Split (s)			21.5	21.5	21.5	9.0	20.0			10.0	21.0	
Total Split (s)			22.0	22.0	22.0	19.0	118.0			10.0	109.0	
Total Split (%)			14.7%	14.7%	14.7%	12.7%	78.7%			6.7%	72.7%	
Yellow Time (s)			4.0	4.0	4.0	3.0	4.0			3.0	4.0	
All-Red Time (s)			1.5	1.5	1.5	0.0	1.0			0.0	1.2	
Lost Time Adjust (s)			-1.0	-1.0	-1.0	0.0	0.0			1.0	-1.0	
Total Lost Time (s)			4.5	4.5	4.5	3.0	5.0			4.0	4.2	
Lead/Lag								Lead	Lag		Lead	Lag
Lead-Lag Optimize?												
Recall Mode					Max	Max	Max	Max	C-Max		None	C-Max

Intersection Summary

Area Type: Other

Cycle Length: 150

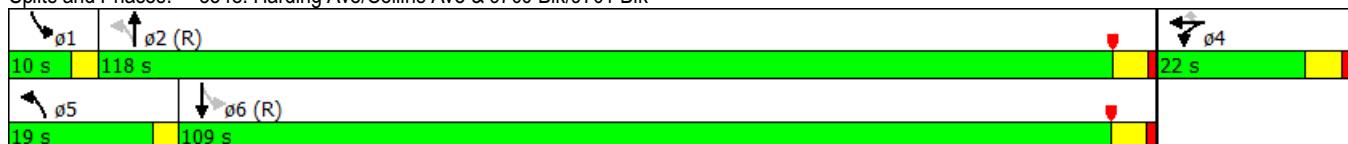
Actuated Cycle Length: 150

Offset: 149 (99%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 3548: Harding Ave/Collins Ave & 9700 Blk/9701 Blk



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↑	↑	↑	↑↑↑		↑	↑↑↑	
Volume (veh/h)	0	0	0	39	0	5	10	2410	51	19	1909	4
Number				7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00	1.00	1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1900	1900	1900	1864	1900	1900	1863	1900
Adj Flow Rate, veh/h				42	0	5	11	2591	55	20	2053	4
Adj No. of Lanes				2	0	1	1	3	0	1	3	0
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	2	2	0	2	2
Cap, veh/h				422	0	188	384	3999	84	133	3662	7
Arrive On Green				0.12	0.00	0.12	0.11	0.78	0.78	0.02	1.00	1.00
Sat Flow, veh/h				3619	0	1615	1810	5128	108	1810	5241	10
Grp Volume(v), veh/h				42	0	5	11	1710	936	20	1328	729
Grp Sat Flow(s), veh/h/ln				1810	0	1615	1810	1696	1844	1810	1695	1861
Q Serve(g_s), s				1.6	0.0	0.4	0.2	33.6	34.0	0.5	0.0	0.0
Cycle Q Clear(g_c), s				1.6	0.0	0.4	0.2	33.6	34.0	0.5	0.0	0.0
Prop In Lane				1.00		1.00	1.00		0.06	1.00		0.01
Lane Grp Cap(c), veh/h				422	0	188	384	2645	1438	133	2369	1300
V/C Ratio(X)				0.10	0.00	0.03	0.03	0.65	0.65	0.15	0.56	0.56
Avail Cap(c_a), veh/h				422	0	188	384	2645	1438	183	2369	1300
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)				1.00	0.00	1.00	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh				59.2	0.0	58.7	2.7	7.3	7.4	8.6	0.0	0.0
Incr Delay (d2), s/veh				0.5	0.0	0.3	0.1	1.2	2.3	0.2	0.8	1.4
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln				0.8	0.0	0.4	0.1	15.9	18.1	0.3	0.3	0.5
LnGrp Delay(d), s/veh				59.7	0.0	59.0	2.8	8.6	9.7	8.7	0.8	1.4
LnGrp LOS				E		E	A	A	A	A	A	A
Approach Vol, veh/h						47			2657		2077	
Approach Delay, s/veh						59.6			8.9		1.1	
Approach LOS						E			A		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		
Phs Duration (G+Y+Rc), s	5.8	122.2		22.0	19.0	109.0		
Change Period (Y+Rc), s	3.0	* 5.2		5.5	3.0	* 5.2		
Max Green Setting (Gmax), s	7.0	* 1.1E2		16.5	16.0	* 1E2		
Max Q Clear Time (g_c+1), s	2.5	36.0		3.6	2.2	2.0		
Green Ext Time (p_c), s	0.0	42.4		0.1	0.0	47.8		

Intersection Summary

HCM 2010 Ctrl Delay	6.0
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

User approved ignoring U-Turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

3005: Collins Ave & 96th St
Timings

2020 Pk Sea w- Enhanced Plan w/ 855KSF
BHS Expansion with Optimized Network

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↗ ↘		↗ ↖	↗ ↖	↗ ↖	↑ ↗	↑ ↗ ↖				
Volume (vph)	401	5	0	0	10	8	539	2040	11	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		0%			0%			0%		0%		0%
Storage Length (ft)	0		0	0		0	300		0	0		0
Storage Lanes	1		0	0		0	1		0	0		0
Taper Length (ft)	25			25			50			25		
Right Turn on Red		Yes			Yes				Yes		Yes	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		292			368			663			419	
Travel Time (s)		6.6			8.4			15.1			9.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)	49%											
Turn Type	Split	NA			NA			Prot	NA			
Protected Phases	4	4			8			5	2			
Permitted Phases												
Detector Phase	4	4			8			5	2			
Switch Phase												
Minimum Initial (s)	4.0	4.0			7.0			4.0	4.0			
Minimum Split (s)	25.0	25.0			12.0			24.0	31.0			
Total Split (s)	39.0	39.0			12.0			82.0	99.0			
Total Split (%)	26.0%	26.0%			8.0%			54.7%	66.0%			
Yellow Time (s)	4.0	4.0			4.0			4.0	4.0			
All-Red Time (s)	1.0	1.0			1.0			1.0	1.0			
Lost Time Adjust (s)	-1.0	-1.0			-1.0			-1.0	-1.0			
Total Lost Time (s)	4.0	4.0			4.0			4.0	4.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Ped	Ped			None			Max	C-Max			

Intersection Summary

Area Type: Other

Cycle Length: 150

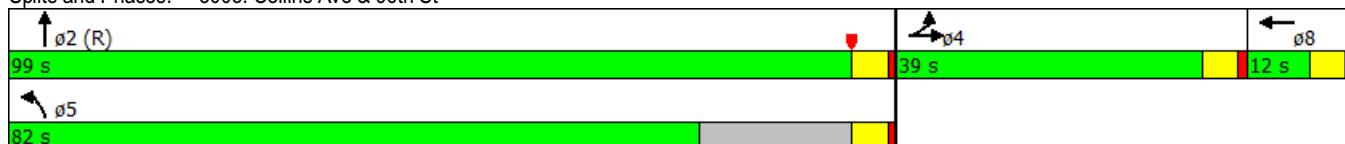
Actuated Cycle Length: 150

Offset: 103 (69%), Referenced to phase 2:NBT, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 3005: Collins Ave & 96th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑			↑		↑	↑↑↑		0	0	0
Volume (veh/h)	401	5	0	0	10	8	539	2040	11	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1864	0	0	1900	1900	1900	1863	1900			
Adj Flow Rate, veh/h	426	0	0	0	11	8	567	2147	12			
Adj No. of Lanes	2	1	0	0	1	0	1	3	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	0	0	0	0	0	0	2	0			
Cap, veh/h	517	272	0	0	33	24	1343	3872	22			
Arrive On Green	0.15	0.00	0.00	0.00	0.03	0.03	0.74	0.74	0.74			
Sat Flow, veh/h	3548	1864	0	0	1024	745	1810	5219	29			
Grp Volume(v), veh/h	426	0	0	0	0	19	567	1394	765			
Grp Sat Flow(s),veh/h/ln	1774	1864	0	0	0	1769	1810	1695	1858			
Q Serve(g_s), s	17.5	0.0	0.0	0.0	0.0	1.6	17.7	27.0	27.1			
Cycle Q Clear(g_c), s	17.5	0.0	0.0	0.0	0.0	1.6	17.7	27.0	27.1			
Prop In Lane	1.00		0.00	0.00		0.42	1.00		0.02			
Lane Grp Cap(c), veh/h	517	272	0	0	0	57	1343	2516	1378			
V/C Ratio(X)	0.82	0.00	0.00	0.00	0.00	0.33	0.42	0.55	0.55			
Avail Cap(c_a), veh/h	828	435	0	0	0	94	1343	2516	1378			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(l)	0.65	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	62.2	0.0	0.0	0.0	0.0	71.2	7.3	8.5	8.5			
Incr Delay (d2), s/veh	1.9	0.0	0.0	0.0	0.0	2.5	1.0	0.9	1.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(-26165%),veh/ln	8.7	0.0	0.0	0.0	0.0	0.8	9.2	12.9	14.4			
LnGrp Delay(d),s/veh	64.1	0.0	0.0	0.0	0.0	73.7	8.2	9.4	10.1			
LnGrp LOS	E					E	A	A	B			
Approach Vol, veh/h	426				19				2726			
Approach Delay, s/veh	64.1				73.7				9.3			
Approach LOS	E				E				A			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4					8				
Phs Duration (G+Y+Rc), s	115.3		25.9					8.8				
Change Period (Y+Rc), s	5.0		5.0					5.0				
Max Green Setting (Gmax), s	77.0		34.0					7.0				
Max Q Clear Time (g_c+1), s	29.1		19.5					3.6				
Green Ext Time (p_c), s	12.2		1.4					0.0				

Intersection Summary

HCM 2010 Ctrl Delay 17.1

HCM 2010 LOS B

Notes

User approved volume balancing among the lanes for turning movement.

2919: Harding Ave & 96th St
Timings

2020 Pk Sea w- Enhanced Plan w/ 855KSF
BHS Expansion with Optimized Network

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑↑					↑↑↑	↑	
Volume (vph)	0	437	553	0	539	0	0	0	0	51	1621	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		0%			0%			0%		0%		0%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red		No			Yes				Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		283			292			669			260	
Travel Time (s)		6.4			6.6			15.2			5.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	0%	0%	0%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)			16%									
Turn Type	NA	Perm		NA					Perm	NA	Perm	
Protected Phases	4			8						6		
Permitted Phases		4							6		6	
Detector Phase	4	4		8					6	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0					4.0	4.0	4.0	
Minimum Split (s)	24.0	24.0		24.0					71.0	71.0	71.0	
Total Split (s)	76.0	76.0		76.0					74.0	74.0	74.0	
Total Split (%)	50.7%	50.7%		50.7%					49.3%	49.3%	49.3%	
Yellow Time (s)	4.0	4.0		4.0					4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0					1.0	1.0	1.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0					-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0	4.0		4.0					4.0	4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max					C-Max	C-Max	C-Max	

Intersection Summary

Area Type: Other

Cycle Length: 150

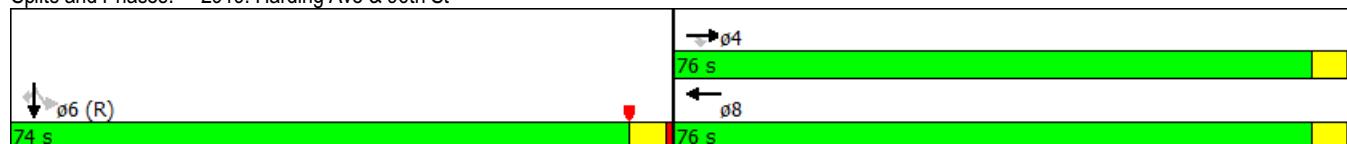
Actuated Cycle Length: 150

Offset: 14 (9%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 105

Control Type: Actuated-Coordinated

Splits and Phases: 2919: Harding Ave & 96th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑↑					↑↑↑	↑	
Volume (veh/h)	0	437	553	0	539	0	0	0	0	51	1621	316
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	0	1863	0				1900	1864	1881
Adj Flow Rate, veh/h	0	557	526	0	573	0				54	1724	336
Adj No. of Lanes	0	1	1	0	2	0				0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	2	2	0	2	0				1	2	1
Cap, veh/h	0	894	760	0	1699	0				70	2379	746
Arrive On Green	0.00	0.80	0.80	0.00	0.48	0.00				0.47	0.47	0.47
Sat Flow, veh/h	0	1863	1583	0	3725	0				150	5099	1599
Grp Volume(v), veh/h	0	557	526	0	573	0				668	1110	336
Grp Sat Flow(s),veh/h/ln	0	1863	1583	0	1770	0				1856	1696	1599
Q Serve(g_s), s	0.0	17.8	22.2	0.0	15.1	0.0				45.0	38.9	21.3
Cycle Q Clear(g_c), s	0.0	17.8	22.2	0.0	15.1	0.0				45.0	38.9	21.3
Prop In Lane	0.00		1.00	0.00		0.00				0.08		1.00
Lane Grp Cap(c), veh/h	0	894	760	0	1699	0				866	1583	746
V/C Ratio(X)	0.00	0.62	0.69	0.00	0.34	0.00				0.77	0.70	0.45
Avail Cap(c_a), veh/h	0	894	760	0	1699	0				866	1583	746
HCM Platoon Ratio	1.00	1.67	1.67	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(l)	0.00	1.00	1.00	0.00	0.90	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	9.5	9.9	0.0	24.2	0.0				33.3	31.7	27.0
Incr Delay (d2), s/veh	0.0	3.3	5.1	0.0	0.5	0.0				6.6	2.6	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.0	9.5	10.3	0.0	7.4	0.0				24.6	18.8	9.8
LnGrp Delay(d),s/veh	0.0	12.8	15.1	0.0	24.7	0.0				39.9	34.3	29.0
LnGrp LOS		B	B		C					D	C	C
Approach Vol, veh/h	1083			573						2114		
Approach Delay, s/veh	13.9			24.7						35.2		
Approach LOS		B		C						D		

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				76.0		74.0		76.0
Change Period (Y+Rc), s				5.0		5.0		5.0
Max Green Setting (Gmax), s				71.0		69.0		71.0
Max Q Clear Time (g_c+1), s				24.2		47.0		17.1
Green Ext Time (p_c), s				2.0		2.8		2.0

Intersection Summary

HCM 2010 Ctrl Delay	27.5
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

3648: Byron/Loading & 96th St
Timings

2020 Pk Sea w- Enhanced Plan w/ 855KSF
BHS Expansion with Optimized Network

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑			↑↑		↑↑	↑			↔	
Volume (vph)	0	1194	0	0	854	1	388	0	54	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	14	11
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	75		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	2		0	0		0
Taper Length (ft)	25			25			25			50		
Right Turn on Red		Yes				Yes			Yes		Yes	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		296			265			570			107	
Travel Time (s)		6.7			6.0			13.0			2.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Turn Type	Perm	NA			NA		Split	NA		Split	NA	
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2					6		8		4	4	
Detector Phase	2	2					8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0		4.0	4.0		5.0	5.0	
Minimum Split (s)	21.0	21.0			21.0		20.0	20.0		10.0	10.0	
Total Split (s)	97.0	97.0			97.0		41.0	41.0		12.0	12.0	
Total Split (%)	64.7%	64.7%			64.7%		27.3%	27.3%		8.0%	8.0%	
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max			C-Max		None	None		None	None	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 126 (84%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 3648: Byron/Loading & 96th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↑	↑	↑	↑↑↑		↑	↑↑↑	
Volume (veh/h)	0	0	0	39	0	5	10	2410	51	19	1909	4
Number				7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00	1.00	1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1900	1900	1900	1864	1900	1900	1863	1900
Adj Flow Rate, veh/h				42	0	5	11	2591	55	20	2053	4
Adj No. of Lanes				2	0	1	1	3	0	1	3	0
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	2	2	0	2	2
Cap, veh/h				422	0	188	384	3999	84	133	3662	7
Arrive On Green				0.12	0.00	0.12	0.11	0.78	0.78	0.02	1.00	1.00
Sat Flow, veh/h				3619	0	1615	1810	5128	108	1810	5241	10
Grp Volume(v), veh/h				42	0	5	11	1710	936	20	1328	729
Grp Sat Flow(s), veh/h/ln				1810	0	1615	1810	1696	1844	1810	1695	1861
Q Serve(g_s), s				1.6	0.0	0.4	0.2	33.6	34.0	0.5	0.0	0.0
Cycle Q Clear(g_c), s				1.6	0.0	0.4	0.2	33.6	34.0	0.5	0.0	0.0
Prop In Lane				1.00		1.00	1.00		0.06	1.00		0.01
Lane Grp Cap(c), veh/h				422	0	188	384	2645	1438	133	2369	1300
V/C Ratio(X)				0.10	0.00	0.03	0.03	0.65	0.65	0.15	0.56	0.56
Avail Cap(c_a), veh/h				422	0	188	384	2645	1438	183	2369	1300
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)				1.00	0.00	1.00	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh				59.2	0.0	58.7	2.7	7.3	7.4	8.6	0.0	0.0
Incr Delay (d2), s/veh				0.5	0.0	0.3	0.1	1.2	2.3	0.2	0.8	1.4
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln				0.8	0.0	0.4	0.1	15.9	18.1	0.3	0.3	0.5
LnGrp Delay(d), s/veh				59.7	0.0	59.0	2.8	8.6	9.7	8.7	0.8	1.4
LnGrp LOS				E		E	A	A	A	A	A	A
Approach Vol, veh/h						47			2657		2077	
Approach Delay, s/veh						59.6			8.9		1.1	
Approach LOS						E			A		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		
Phs Duration (G+Y+Rc), s	5.8	122.2		22.0	19.0	109.0		
Change Period (Y+Rc), s	3.0	* 5.2		5.5	3.0	* 5.2		
Max Green Setting (Gmax), s	7.0	* 1.1E2		16.5	16.0	* 1E2		
Max Q Clear Time (g_c+1), s	2.5	36.0		3.6	2.2	2.0		
Green Ext Time (p_c), s	0.0	42.4		0.1	0.0	47.8		

Intersection Summary

HCM 2010 Ctrl Delay	6.0
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

User approved ignoring U-Turning movement.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBU	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations								
Volume (vph)	6	83	977	28	1153	61	132	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11
Grade (%)				0%	0%	0%		
Storage Length (ft)			125		25	0	0	0
Storage Lanes				1	1	0	2	1
Taper Length (ft)			50		25		25	
Right Turn on Red						Yes		Yes
Link Speed (mph)				30		30		30
Link Distance (ft)				244		296		285
Travel Time (s)				5.5		6.7		6.5
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	2%	0%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0
Parking (#/hr)								
Mid-Block Traffic (%)				0%		0%		0%
Shared Lane Traffic (%)								31%
Turn Type	pm+pt	pm+pt	NA	Perm	NA		Prot	Prot
Protected Phases	5	5	2		6		4	4
Permitted Phases	2	2		6				
Detector Phase	5	5	2	6	6		4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	9.0	9.0	21.0	21.0	21.0		21.0	21.0
Total Split (s)	16.0	16.0	123.0	107.0	107.0		27.0	27.0
Total Split (%)	10.7%	10.7%	82.0%	71.3%	71.3%		18.0%	18.0%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	0.0	0.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)			0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)			3.0	5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag			
Lead-Lag Optimize?								
Recall Mode	None	None	C-Max	C-Max	C-Max		None	None

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 20 (13%), Referenced to phase 2:EBTL and 6:WBTU, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 4344: 96th St & BHS South



Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations								
Volume (veh/h)	6	83	977	28	1153	61	132	109
Number		5	2		6	16	7	14
Initial Q (Qb), veh		0	0		0	0	0	0
Ped-Bike Adj(A_pbT)		1.00				1.00	1.00	1.00
Parking Bus, Adj		1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1863		1865	1900	1900	1900
Adj Flow Rate, veh/h		88	1039		1227	65	169	85
Adj No. of Lanes		1	2		2	0	2	1
Peak Hour Factor		0.94	0.94		0.94	0.94	0.94	0.94
Percent Heavy Veh, %		0	2		2	2	0	0
Cap, veh/h		451	3064		2806	149	244	109
Arrive On Green		0.03	0.87		1.00	1.00	0.07	0.07
Sat Flow, veh/h		1810	3632		3516	181	3619	1615
Grp Volume(v), veh/h		88	1039		634	658	169	85
Grp Sat Flow(s), veh/h/ln		1810	1770		1771	1833	1810	1615
Q Serve(g_s), s		1.1	8.4		0.0	0.0	6.9	7.8
Cycle Q Clear(g_c), s		1.1	8.4		0.0	0.0	6.9	7.8
Prop In Lane		1.00				0.10	1.00	1.00
Lane Grp Cap(c), veh/h		451	3064		1452	1502	244	109
V/C Ratio(X)		0.20	0.34		0.44	0.44	0.69	0.78
Avail Cap(c_a), veh/h		560	3064		1452	1502	531	237
HCM Platoon Ratio		1.00	1.00		2.00	2.00	1.00	1.00
Upstream Filter(l)		1.00	1.00		0.87	0.87	1.00	1.00
Uniform Delay (d), s/veh		1.6	1.9		0.0	0.0	68.4	68.8
Incr Delay (d2), s/veh		0.1	0.3		0.8	0.8	1.3	4.5
Initial Q Delay(d3), s/veh		0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln		0.5	4.2		0.3	0.3	3.5	7.0
LnGrp Delay(d), s/veh		1.7	2.2		0.8	0.8	69.7	73.3
LnGrp LOS		A	A		A	A	E	E
Approach Vol, veh/h			1127		1292		254	
Approach Delay, s/veh			2.2		0.8		70.9	
Approach LOS			A		A		E	
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		134.9		15.1	6.9	128.0		
Change Period (Y+Rc), s		5.0		5.0	3.0	5.0		
Max Green Setting (Gmax), s		118.0		22.0	13.0	102.0		
Max Q Clear Time (g_c+1), s		10.4		9.8	3.1	2.0		
Green Ext Time (p_c), s		20.3		0.4	0.1	20.2		

Intersection Summary

HCM 2010 Ctrl Delay

8.1

HCM 2010 LOS

A

Notes

User approved volume balancing among the lanes for turning movement.

User approved ignoring U-Turning movement.

855,000 sq ft - Scenario 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑		↑↑				↑↑	↑↑↑↑		↑↑	↑↑↑↑	
Volume (vph)	312	0	173	0	0	0	136	2145	4	26	1695	348
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)												
Storage Length (ft)	0		0	0		0	200		0	100		0
Storage Lanes	2		1	0		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		122			209			297			1786	
Travel Time (s)		2.8			4.8			6.8			40.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Turn Type	Prot		Perm				pm+pt	NA		pm+pt	NA	
Protected Phases	7						5	2		1	6	
Permitted Phases			7				2			6		
Detector Phase	7		7				5	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0		15.0				4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0		20.0				9.0	20.0		18.0	20.0	
Total Split (s)	29.0		29.0				24.0	103.0		18.0	97.0	
Total Split (%)	19.3%		19.3%				16.0%	68.7%		12.0%	64.7%	
Yellow Time (s)	4.0		4.0				4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0		1.0				1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0		0.0				0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0		5.0				5.0	5.0		5.0	5.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	Min		Min				Min	C-Max		Max	C-Max	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 3 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 5: Collins Ave & N Drive/Condo Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	312	0	173	0	0	0	136	2145	4	26	1695	348
Number	7	4	14				5	2	12	1	6	16
Initial Q (Q _b), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900				1900	1863	1900	1900	1869	1900
Adj Flow Rate, veh/h	335	0	186				146	2306	4	28	1823	374
Adj No. of Lanes	2	0	1				1	3	0	1	3	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	2	2	0	2	2
Cap, veh/h	459	0	211				214	3579	6	315	3107	627
Arrive On Green	0.13	0.00	0.13				0.08	1.00	1.00	0.09	0.73	0.73
Sat Flow, veh/h	3510	0	1615				1810	5242	9	1810	4259	859
Grp Volume(v), veh/h	335	0	186				146	1491	819	28	1450	747
Grp Sat Flow(s), veh/h/ln	1755	0	1615				1810	1695	1861	1810	1701	1717
Q Serve(g_s), s	13.8	0.0	17.0				3.8	0.0	0.0	0.5	30.2	31.3
Cycle Q Clear(g_c), s	13.8	0.0	17.0				3.8	0.0	0.0	0.5	30.2	31.3
Prop In Lane	1.00		1.00				1.00		0.00	1.00		0.50
Lane Grp Cap(c), veh/h	459	0	211				214	2315	1271	315	2481	1252
V/C Ratio(X)	0.73	0.00	0.88				0.68	0.64	0.64	0.09	0.58	0.60
Avail Cap(c_a), veh/h	562	0	258				371	2315	1271	315	2481	1252
HCM Platoon Ratio	1.00	1.00	1.00				2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.21	0.21	0.21	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.7	0.0	64.1				14.4	0.0	0.0	3.6	9.6	9.7
Incr Delay (d2), s/veh	2.7	0.0	21.8				0.3	0.3	0.5	0.6	1.0	2.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln	6.9	0.0	15.7				4.0	0.1	0.2	0.3	14.4	15.5
LnGrp Delay(d), s/veh	65.3	0.0	85.9				14.7	0.3	0.5	4.2	10.6	11.8
LnGrp LOS	E		F				B	A	A	A	B	B
Approach Vol, veh/h	521						2456			2225		
Approach Delay, s/veh	72.7						1.2			10.9		
Approach LOS	E						A			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	18.0	107.4		24.6	11.0	114.4						
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0						
Max Green Setting (Gmax), s	13.0	98.0		24.0	19.0	92.0						
Max Q Clear Time (g_c+l1), s	2.5	2.0		19.0	5.8	33.3						
Green Ext Time (p_c), s	0.0	76.4		0.6	0.2	50.8						
Intersection Summary												
HCM 2010 Ctrl Delay			12.5									
HCM 2010 LOS			B									
Notes												
User approved ignoring U-Turning movement.												

3548: Harding Ave/Collins Ave & 9700 Blk/9701 Blk 2020 Pk Sea w- Enhanced Plan w/ 855KSF
BHS Expansion with Optimized Network (Scenario 1)

Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	39	0	5	13	2417	51	19	1939	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)					0%				0%			0%
Storage Length (ft)	0			0		0	125		0	125		0
Storage Lanes	0			0	1		1	1		0	1	0
Taper Length (ft)	25				25			25			50	
Right Turn on Red				Yes			Yes			Yes		Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		149			204			380			297	
Travel Time (s)		3.4			4.6			8.6			6.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)				50%								
Turn Type				Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases					4		5	2		1	6	
Permitted Phases				4		4	2			6	6	
Detector Phase				4	4	4	5	2		1	6	
Switch Phase												
Minimum Initial (s)				15.0	15.0	15.0	4.0	4.0		5.0	4.0	
Minimum Split (s)				21.5	21.5	21.5	9.0	20.0		10.0	21.0	
Total Split (s)				22.0	22.0	22.0	15.0	118.0		10.0	113.0	
Total Split (%)				14.7%	14.7%	14.7%	10.0%	78.7%		6.7%	75.3%	
Yellow Time (s)				4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)				1.5	1.5	1.5	1.0	1.0		1.0	1.2	
Lost Time Adjust (s)				-1.0	-1.0	-1.0	0.0	0.0		1.0	-1.0	
Total Lost Time (s)				4.5	4.5	4.5	4.0	5.0		5.0	4.2	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode					Max	Max	Max	Max	C-Max		None	C-Max

Intersection Summary

Area Type: Other

Cycle Length: 150

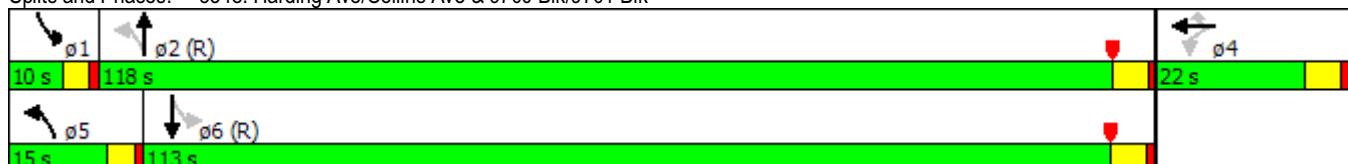
Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 3548: Harding Ave/Collins Ave & 9700 Blk/9701 Blk



3548: Harding Ave/Collins Ave & 9700 Blk/9701 Blk 2020 Pk Sea w- Enhanced Plan w/ 855KSF
 BHS Expansion with Optimized Network (Scenario 1)

HCM 2010 Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	39	0	5	13	2417	51	19	1939	4
Number				7	4	14	5	2	12	1	6	16
Initial Q (Q _b), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1900	1900	1900	1864	1900	1900	1863	1900
Adj Flow Rate, veh/h				42	0	5	14	2599	55	20	2085	4
Adj No. of Lanes				2	0	1	1	3	0	1	3	0
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	2	2	0	2	2
Cap, veh/h				422	0	188	325	3965	84	131	3802	7
Arrive On Green				0.12	0.00	0.12	0.07	0.77	0.77	0.02	1.00	1.00
Sat Flow, veh/h				3619	0	1615	1810	5128	108	1810	5241	10
Grp Volume(v), veh/h				42	0	5	14	1715	939	20	1349	740
Grp Sat Flow(s), veh/h/ln				1810	0	1615	1810	1696	1844	1810	1695	1861
Q Serve(g_s), s				1.6	0.0	0.4	0.2	34.8	35.3	0.5	0.0	0.0
Cycle Q Clear(g_c), s				1.6	0.0	0.4	0.2	34.8	35.3	0.5	0.0	0.0
Prop In Lane				1.00		1.00	1.00		0.06	1.00		0.01
Lane Grp Cap(c), veh/h				422	0	188	325	2622	1426	131	2459	1350
V/C Ratio(X)				0.10	0.00	0.03	0.04	0.65	0.66	0.15	0.55	0.55
Avail Cap(c_a), veh/h				422	0	188	325	2622	1426	169	2459	1350
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)				1.00	0.00	1.00	1.00	1.00	1.00	0.71	0.71	0.71
Uniform Delay (d), s/veh				59.2	0.0	58.7	2.9	7.8	7.9	8.6	0.0	0.0
Incr Delay (d2), s/veh				0.5	0.0	0.3	0.2	1.3	2.4	0.1	0.6	1.1
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln				0.8	0.0	0.4	0.1	16.4	18.7	0.2	0.2	0.4
LnGrp Delay(d), s/veh				59.7	0.0	59.0	3.1	9.1	10.3	8.8	0.6	1.1
LnGrp LOS				E		E	A	A	B	A	A	A
Approach Vol, veh/h						47			2668		2109	
Approach Delay, s/veh						59.6			9.5		0.9	
Approach LOS						E			A		A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	6.8	121.2		22.0	15.0	113.0						
Change Period (Y+Rc), s	4.0	* 5.2		5.5	4.0	* 5.2						
Max Green Setting (Gmax), s	6.0	* 1.1E2		16.5	11.0	* 1.1E2						
Max Q Clear Time (g_c+l1), s	2.5	37.3		3.6	2.2	2.0						
Green Ext Time (p_c), s	0.0	42.8		0.1	0.0	49.6						
Intersection Summary												
HCM 2010 Ctrl Delay				6.2								
HCM 2010 LOS				A								
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓			↑		↑	↑↑↑				
Volume (vph)	408	5	0	0	10	8	555	2040	11	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)					0%			0%				0%
Storage Length (ft)	0					0	300		0	0		0
Storage Lanes	1					0	1		0	0		0
Taper Length (ft)	25				25			50			25	
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		292			368			663			419	
Travel Time (s)		6.6			8.4			15.1			9.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)	49%											
Turn Type	Split	NA			NA		Prot	NA				
Protected Phases	4	4			8		5	2				
Permitted Phases												
Detector Phase	4	4			8		5	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0			7.0		4.0	4.0				
Minimum Split (s)	25.0	25.0			12.0		24.0	31.0				
Total Split (s)	39.0	39.0			12.0		79.0	99.0				
Total Split (%)	26.0%	26.0%			8.0%		52.7%	66.0%				
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0				
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0				
Lost Time Adjust (s)	-1.0	-1.0			-1.0		-1.0	-1.0				
Total Lost Time (s)	4.0	4.0			4.0		4.0	4.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Ped	Ped			None		Max	C-Max				

Intersection Summary

Area Type: Other

Cycle Length: 150

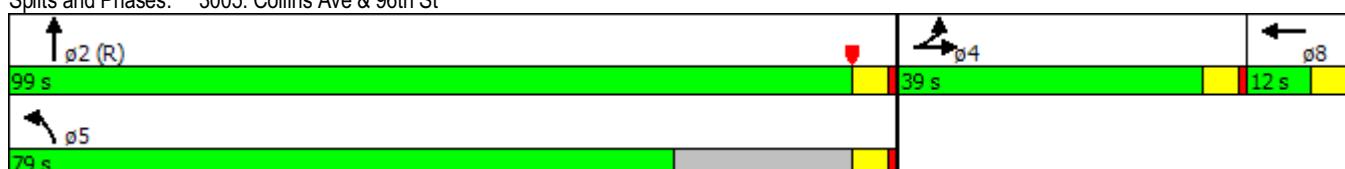
Actuated Cycle Length: 150

Offset: 102 (68%), Referenced to phase 2:NBT, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 3005: Collins Ave & 96th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	408	5	0	0	10	8	555	2040	11	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1864	0	0	1900	1900	1900	1863	1900			
Adj Flow Rate, veh/h	433	0	0	0	11	8	584	2147	12			
Adj No. of Lanes	2	1	0	0	1	0	1	3	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	0	0	0	0	0	0	2	0			
Cap, veh/h	525	276	0	0	33	24	1339	3862	22			
Arrive On Green	0.15	0.00	0.00	0.00	0.03	0.03	0.74	0.74	0.73			
Sat Flow, veh/h	3548	1864	0	0	1024	745	1810	5219	29			
Grp Volume(v), veh/h	433	0	0	0	0	19	584	1394	765			
Grp Sat Flow(s), veh/h/ln	1774	1864	0	0	0	1769	1810	1695	1858			
Q Serve(g_s), s	17.8	0.0	0.0	0.0	0.0	1.6	18.6	27.2	27.3			
Cycle Q Clear(g_c), s	17.8	0.0	0.0	0.0	0.0	1.6	18.6	27.2	27.3			
Prop In Lane	1.00		0.00	0.00		0.42	1.00		0.02			
Lane Grp Cap(c), veh/h	525	276	0	0	0	57	1339	2509	1375			
V/C Ratio(X)	0.83	0.00	0.00	0.00	0.00	0.33	0.44	0.56	0.56			
Avail Cap(c_a), veh/h	828	435	0	0	0	94	1339	2509	1375			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(l)	0.61	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	62.0	0.0	0.0	0.0	0.0	71.2	7.5	8.6	8.6			
Incr Delay (d2), s/veh	1.9	0.0	0.0	0.0	0.0	2.5	1.0	0.9	1.6			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(-26165%), veh/ln	8.9	0.0	0.0	0.0	0.0	0.8	9.6	12.9	14.4			
LnGrp Delay(d), s/veh	64.0	0.0	0.0	0.0	0.0	73.7	8.5	9.5	10.3			
LnGrp LOS	E					E	A	A	B			
Approach Vol, veh/h	433				19				2743			
Approach Delay, s/veh	64.0				73.7				9.5			
Approach LOS	E				E				A			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s	115.0		26.2					8.8				
Change Period (Y+Rc), s	5.0		5.0					5.0				
Max Green Setting (Gmax), s	74.0		34.0					7.0				
Max Q Clear Time (g_c+1), s	29.3		19.8					3.6				
Green Ext Time (p_c), s	12.2		1.4					0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			17.3									
HCM 2010 LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

Timings

2919: Harding Ave & 96th St

1/21/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	437	598	0	569	0	0	0	0	53	1654	316
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	0%	0%	0%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%					0%	
Shared Lane Traffic (%)				19%								
Number of Detectors	1	1			1					1	1	1
Detector Template												
Leading Detector (ft)	50	50		50						50	50	50
Trailing Detector (ft)	0	0		0						0	0	0
Turn Type	NA	Perm		NA						Perm	NA	Perm
Protected Phases	4			8						6		
Permitted Phases		4								6		6
Detector Phase	4	4		8						6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0						4.0	4.0	4.0
Minimum Split (s)	24.0	24.0		24.0						71.0	71.0	71.0
Total Split (s)	77.0	77.0		77.0						73.0	73.0	73.0
Total Split (%)	51.3%	51.3%		51.3%						48.7%	48.7%	48.7%
Yellow Time (s)	4.0	4.0		4.0						4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0						1.0	1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0						-1.0	-1.0	
Total Lost Time (s)	4.0	4.0		4.0						4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max						C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 150

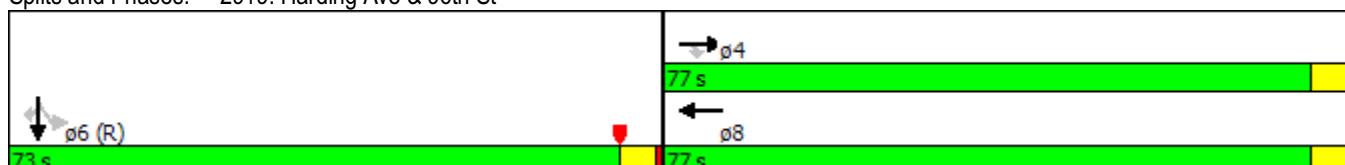
Actuated Cycle Length: 150

Offset: 14 (9%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 105

Control Type: Actuated-Coordinated

Splits and Phases: 2919: Harding Ave & 96th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	437	598	0	569	0	0	0	0	53	1654	316
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00					1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	0	1863	0				1900	1864	1881
Adj Flow Rate, veh/h	0	593	550	0	605	0				56	1760	336
Adj No. of Lanes	0	1	1	0	2	0				0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	2	2	0	2	0				1	2	1
Cap, veh/h	0	907	771	0	1722	0				70	2344	736
Arrive On Green	0.00	0.33	0.33	0.00	0.49	0.00				0.46	0.46	0.46
Sat Flow, veh/h	0	1863	1583	0	3725	0				152	5096	1599
Grp Volume(v), veh/h	0	593	550	0	605	0				682	1134	336
Grp Sat Flow(s), veh/h/ln	0	1863	1583	0	1770	0				1856	1696	1599
Q Serve(g_s), s	0.0	40.9	45.8	0.0	15.9	0.0				47.1	40.7	21.5
Cycle Q Clear(g_c), s	0.0	40.9	45.8	0.0	15.9	0.0				47.1	40.7	21.5
Prop In Lane	0.00		1.00	0.00		0.00				0.08		1.00
Lane Grp Cap(c), veh/h	0	907	771	0	1722	0				854	1560	736
V/C Ratio(X)	0.00	0.65	0.71	0.00	0.35	0.00				0.80	0.73	0.46
Avail Cap(c_a), veh/h	0	907	771	0	1722	0				854	1560	736
HCM Platoon Ratio	1.00	0.67	0.67	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter()	0.00	1.00	1.00	0.00	0.89	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	39.7	41.4	0.0	23.8	0.0				34.6	32.8	27.7
Incr Delay (d2), s/veh	0.0	3.7	5.6	0.0	0.5	0.0				7.7	3.0	2.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln	0.0	22.0	21.2	0.0	7.9	0.0				25.9	19.7	9.9
LnGrp Delay(d), s/veh	0.0	43.4	47.0	0.0	24.3	0.0				42.3	35.8	29.7
LnGrp LOS		D	D		C					D	D	C
Approach Vol, veh/h	1143			605						2152		
Approach Delay, s/veh	45.1			24.3						36.9		
Approach LOS		D		C						D		

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				77.0		73.0		77.0
Change Period (Y+Rc), s				5.0		5.0		5.0
Max Green Setting (Gmax), s				72.0		68.0		72.0
Max Q Clear Time (g_c+l1), s				47.8		49.1		17.9
Green Ext Time (p_c), s				2.2		2.9		2.2

Intersection Summary

HCM 2010 Ctrl Delay	37.4
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	437	598	0	569	0	0	0	0	53	1654	316
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00					1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	0	1863	0				1900	1864	1881
Adj Flow Rate, veh/h	0	593	550	0	605	0				56	1760	336
Adj No. of Lanes	0	1	1	0	2	0				0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	2	2	0	2	0				1	2	1
Cap, veh/h	0	907	771	0	1722	0				70	2344	736
Arrive On Green	0.00	0.81	0.81	0.00	0.49	0.00				0.46	0.46	0.46
Sat Flow, veh/h	0	1863	1583	0	3725	0				152	5096	1599
Grp Volume(v), veh/h	0	593	550	0	605	0				682	1134	336
Grp Sat Flow(s), veh/h/ln	0	1863	1583	0	1770	0				1856	1696	1599
Q Serve(g_s), s	0.0	19.1	23.2	0.0	15.9	0.0				47.1	40.7	21.5
Cycle Q Clear(g_c), s	0.0	19.1	23.2	0.0	15.9	0.0				47.1	40.7	21.5
Prop In Lane	0.00		1.00	0.00		0.00				0.08		1.00
Lane Grp Cap(c), veh/h	0	907	771	0	1722	0				854	1560	736
V/C Ratio(X)	0.00	0.65	0.71	0.00	0.35	0.00				0.80	0.73	0.46
Avail Cap(c_a), veh/h	0	907	771	0	1722	0				854	1560	736
HCM Platoon Ratio	1.00	1.67	1.67	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter()	0.00	1.00	1.00	0.00	0.89	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	9.0	9.4	0.0	23.8	0.0				34.6	32.8	27.7
Incr Delay (d2), s/veh	0.0	3.7	5.6	0.0	0.5	0.0				7.7	3.0	2.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln	0.0	10.2	10.8	0.0	7.9	0.0				25.9	19.7	9.9
LnGrp Delay(d), s/veh	0.0	12.7	15.0	0.0	24.3	0.0				42.3	35.8	29.7
LnGrp LOS		B	B		C					D	D	C
Approach Vol, veh/h	1143			605							2152	
Approach Delay, s/veh	13.8			24.3							36.9	
Approach LOS		B		C						D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				77.0		73.0		77.0				
Change Period (Y+Rc), s				5.0		5.0		5.0				
Max Green Setting (Gmax), s				72.0		68.0		72.0				
Max Q Clear Time (g_c+l1), s				25.2		49.1		17.9				
Green Ext Time (p_c), s				2.2		2.9		2.2				
Intersection Summary												
HCM 2010 Ctrl Delay				28.2								
HCM 2010 LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑			↑↑		↑↑	↑			↑	
Volume (vph)	0	1239	0	0	870	1	388	0	54	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	10	10	11	11	14	11
Grade (%)					0%			0%			0%	
Storage Length (ft)	75			0	0		0	0	0	0	0	0
Storage Lanes	1			0	0		0	2	0	0	0	0
Taper Length (ft)	25				25			25			50	
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		296			265			570			107	
Travel Time (s)		6.7			6.0			13.0			2.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Turn Type	Perm	NA			NA		Split	NA		Split	NA	
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2											
Detector Phase	2	2			6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0		4.0	4.0		5.0	5.0	
Minimum Split (s)	22.0	22.0			22.0		29.0	29.0		11.0	11.0	
Total Split (s)	98.0	98.0			98.0		39.0	39.0		13.0	13.0	
Total Split (%)	65.3%	65.3%			65.3%		26.0%	26.0%		8.7%	8.7%	
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0			1.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0		
Total Lost Time (s)	5.0	5.0			5.0		6.0	6.0		6.0		
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max			C-Max		Ped	Ped		None	None	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 125 (83%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 3648: Byron/Loading & 96th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1239	0	0	870	1	388	0	54	1	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	0	0	1863	1900	1900	1900	1900	1900	1976	1900
Adj Flow Rate, veh/h	0	1304	0	0	916	1	408	0	57	1	0	0
Adj No. of Lanes	1	2	0	0	2	0	2	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	0	2	2	0	0	0	0	0	0
Cap, veh/h	48	2662	0	0	2728	3	468	0	215	3	0	0
Arrive On Green	0.00	1.00	0.00	0.00	1.00	1.00	0.13	0.00	0.13	0.00	0.00	0.00
Sat Flow, veh/h	619	3632	0	0	3721	4	3510	0	1615	1882	0	0
Grp Volume(v), veh/h	0	1304	0	0	447	470	408	0	57	1	0	0
Grp Sat Flow(s), veh/h/ln	619	1770	0	0	1770	1862	1755	0	1615	1882	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	17.1	0.0	4.8	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	17.1	0.0	4.8	0.1	0.0	0.0
Prop In Lane	1.00		0.00	0.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	48	2662	0	0	1331	1400	468	0	215	3	0	0
V/C Ratio(X)	0.00	0.49	0.00	0.00	0.34	0.34	0.87	0.00	0.26	0.39	0.00	0.00
Avail Cap(c_a), veh/h	48	2662	0	0	1331	1400	772	0	355	88	0	0
HCM Platoon Ratio	2.00	2.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.00	0.91	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	63.7	0.0	58.4	74.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.0	0.7	0.6	3.3	0.0	0.2	32.3	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln	0.0	0.2	0.0	0.0	0.3	0.3	8.5	0.0	2.1	0.1	0.0	0.0
LnGrp Delay(d), s/veh	0.0	0.6	0.0	0.0	0.7	0.6	67.0	0.0	58.6	107.2	0.0	0.0
LnGrp LOS	A		A	A	E		E		F			
Approach Vol, veh/h	1304			917			465			1		
Approach Delay, s/veh	0.6			0.7			66.0			107.2		
Approach LOS	A		A				E			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s	117.8		6.2		117.8		26.0					
Change Period (Y+Rc), s	5.0		6.0		5.0		6.0					
Max Green Setting (Gmax), s	93.0		7.0		93.0		33.0					
Max Q Clear Time (g_c+l1), s	2.0		2.1		2.0		19.1					
Green Ext Time (p_c), s	8.0		0.0		8.0		0.9					
Intersection Summary												
HCM 2010 Ctrl Delay		12.0										
HCM 2010 LOS		B										



Lane Group	EBU	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑↑	↑	↑↑	↑↑	↑↑	↑
Volume (vph)	6	138	955	28	1129	101	199	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11
Grade (%)				0%	0%	0%	0%	0%
Storage Length (ft)		125		25		0	0	0
Storage Lanes		1		1		0	2	1
Taper Length (ft)		50		25			25	
Right Turn on Red						Yes		Yes
Link Speed (mph)				30		30		30
Link Distance (ft)				244		296		285
Travel Time (s)				5.5		6.7		6.5
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	2%	0%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0
Parking (#/hr)								
Mid-Block Traffic (%)				0%		0%		0%
Shared Lane Traffic (%)								31%
Turn Type	pm+pt	pm+pt	NA	Perm	NA		Prot	Prot
Protected Phases	5	5	2		6		4	4
Permitted Phases	2	2		6				
Detector Phase	5	5	2	6	6		4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	9.0	9.0	21.0	21.0	21.0		21.0	21.0
Total Split (s)	22.0	22.0	121.0	99.0	99.0		29.0	29.0
Total Split (%)	14.7%	14.7%	80.7%	66.0%	66.0%		19.3%	19.3%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	0.0	0.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)			0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)			3.0	5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag			
Lead-Lag Optimize?								
Recall Mode	None	None	C-Max	C-Max	C-Max		None	None

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 20 (13%), Referenced to phase 2:EBTL and 6:WBTU, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 4344: 96th St & BHS South





Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations								
Volume (veh/h)	6	138	955	28	1129	101	199	165
Number		5	2		6	16	7	14
Initial Q (Q _b), veh		0	0		0	0	0	0
Ped-Bike Adj(A_pbT)		1.00				1.00	1.00	1.00
Parking Bus, Adj		1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1863		1866	1900	1900	1900
Adj Flow Rate, veh/h		147	1016		1201	107	256	129
Adj No. of Lanes		1	2		2	0	2	1
Peak Hour Factor		0.94	0.94		0.94	0.94	0.94	0.94
Percent Heavy Veh, %		0	2		2	2	0	0
Cap, veh/h		386	2965		2597	231	346	154
Arrive On Green		0.03	0.84		0.79	0.79	0.10	0.10
Sat Flow, veh/h		1810	3632		3387	293	3619	1615
Grp Volume(v), veh/h		147	1016		645	663	256	129
Grp Sat Flow(s), veh/h/ln		1810	1770		1772	1814	1810	1615
Q Serve(g_s), s		2.2	9.8		18.2	18.3	10.3	11.8
Cycle Q Clear(g_c), s		2.2	9.8		18.2	18.3	10.3	11.8
Prop In Lane		1.00				0.16	1.00	1.00
Lane Grp Cap(c), veh/h		386	2965		1398	1430	346	154
V/C Ratio(X)		0.38	0.34		0.46	0.46	0.74	0.84
Avail Cap(c_a), veh/h		562	2965		1398	1430	579	258
HCM Platoon Ratio		1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(l)		1.00	1.00		0.87	0.87	1.00	1.00
Uniform Delay (d), s/veh		4.4	2.8		5.3	5.3	66.0	66.7
Incr Delay (d2), s/veh		0.2	0.3		1.0	0.9	1.2	4.5
Initial Q Delay(d3), s/veh		0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln		1.2	4.8		9.2	9.4	5.2	10.4
LnGrp Delay(d), s/veh		4.6	3.1		6.2	6.2	67.2	71.2
LnGrp LOS		A	A		A	A	E	E
Approach Vol, veh/h			1163		1308		385	
Approach Delay, s/veh			3.3		6.2		68.5	
Approach LOS			A		A		E	
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+R _c), s		130.7		19.3	7.4	123.3		
Change Period (Y+R _c), s		5.0		5.0	3.0	5.0		
Max Green Setting (G _{max}), s		116.0		24.0	19.0	94.0		
Max Q Clear Time (g _{c+1}), s		11.8		13.8	4.2	20.3		
Green Ext Time (p _c), s		20.2		0.6	0.2	19.7		
Intersection Summary								
HCM 2010 Ctrl Delay			13.4					
HCM 2010 LOS			B					

Notes

User approved volume balancing among the lanes for turning movement.
User approved ignoring U-Turning movement.

855,000 sq ft - Scenario 2

5: Collins Ave & N Drive/Condo Dr
BHS Expansion with Optimized Network (Scenario 2)

2020 Pk Sea w- BHS at 855KSF

Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑		↑				↑↑	↑↑↑		↑↑	↑↑↑	
Volume (vph)	465	0	258	0	0	0	219	2046	4	26	1616	581
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)						0%			0%			0%
Storage Length (ft)	0		0	0		0	200		0	100		0
Storage Lanes	2		1	0		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		122			209			297			1786	
Travel Time (s)		2.8			4.8			6.8			40.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Turn Type	Prot		Perm				pm+pt	NA		pm+pt	NA	
Protected Phases	7							5	2		1	6
Permitted Phases			7					2			6	
Detector Phase	7		7				5	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0		15.0				4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0		20.0				9.0	20.0		18.0	20.0	
Total Split (s)	33.0		33.0				27.0	99.0		18.0	90.0	
Total Split (%)	22.0%		22.0%				18.0%	66.0%		12.0%	60.0%	
Yellow Time (s)	4.0		4.0				4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0		1.0				1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0		0.0				0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0		5.0				5.0	5.0		5.0	5.0	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	Min		Min				Min	C-Max		Max	C-Max	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 4 (3%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 5: Collins Ave & N Drive/Condo Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	465	0	258	0	0	0	219	2046	4	26	1616	581
Number	7	4	14				5	2	12	1	6	16
Initial Q (Q _b), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	0	1900				1900	1863	1900	1900	1872	1900
Adj Flow Rate, veh/h	500	0	277				235	2200	4	28	1738	625
Adj No. of Lanes	2	0	1				1	3	0	1	3	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0				0	2	2	0	2	2
Cap, veh/h	644	0	296				255	3301	6	317	2349	809
Arrive On Green	0.18	0.00	0.18				0.18	1.00	1.00	0.09	0.63	0.63
Sat Flow, veh/h	3510	0	1615				1810	5242	10	1810	3758	1294
Grp Volume(v), veh/h	500	0	277				235	1423	781	28	1569	794
Grp Sat Flow(s), veh/h/ln	1755	0	1615				1810	1695	1861	1810	1704	1644
Q Serve(g_s), s	20.3	0.0	25.4				11.4	0.0	0.0	0.7	48.0	52.5
Cycle Q Clear(g_c), s	20.3	0.0	25.4				11.4	0.0	0.0	0.7	48.0	52.5
Prop In Lane	1.00		1.00				1.00		0.01	1.00		0.79
Lane Grp Cap(c), veh/h	644	0	296				255	2135	1172	317	2130	1028
V/C Ratio(X)	0.78	0.00	0.93				0.92	0.67	0.67	0.09	0.74	0.77
Avail Cap(c_a), veh/h	655	0	301				355	2135	1172	317	2130	1028
HCM Platoon Ratio	1.00	1.00	1.00				2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.15	0.15	0.15	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.3	0.0	60.3				38.2	0.0	0.0	6.3	19.5	20.4
Incr Delay (d2), s/veh	5.2	0.0	34.1				4.2	0.3	0.5	0.6	2.3	5.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln	10.3	0.0	23.7				9.7	0.1	0.1	0.4	23.1	25.2
LnGrp Delay(d), s/veh	63.5	0.0	94.5				42.4	0.3	0.5	6.9	21.8	26.0
LnGrp LOS	E		F				D	A	A	A	C	C
Approach Vol, veh/h	777						2439			2391		
Approach Delay, s/veh	74.5						4.4			23.1		
Approach LOS	E						A			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	18.0	99.5		32.5	18.7	98.8						
Change Period (Y+Rc), s	5.0	5.0		5.0	5.0	5.0						
Max Green Setting (Gmax), s	13.0	94.0		28.0	22.0	85.0						
Max Q Clear Time (g_c+l1), s	2.7	2.0		27.4	13.4	54.5						
Green Ext Time (p_c), s	0.0	75.4		0.2	0.3	28.4						
Intersection Summary												
HCM 2010 Ctrl Delay			22.1									
HCM 2010 LOS			C									
Notes												
User approved ignoring U-Turning movement.												

3548: Harding Ave/Collins Ave & 9700 Blk/9701 Blk
BHS Expansion with Optimized Network (Scenario 2)

2020 Pk Sea w- BHS at 855KSF

Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	39	0	5	16	2479	51	19	1965	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)					0%				0%			0%
Storage Length (ft)	0			0		0	125		0	125		0
Storage Lanes	0			0	1		1	1		0	1	0
Taper Length (ft)	25				25			25			50	
Right Turn on Red				Yes			Yes			Yes		Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		149			204			380			297	
Travel Time (s)		3.4			4.6			8.6			6.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)				50%								
Turn Type				Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases					4		5	2		1	6	
Permitted Phases				4		4	2			6	6	
Detector Phase				4	4	4	5	2		1	6	
Switch Phase												
Minimum Initial (s)				15.0	15.0	15.0	4.0	4.0		5.0	4.0	
Minimum Split (s)				21.5	21.5	21.5	9.0	20.0		10.0	21.0	
Total Split (s)				22.0	22.0	22.0	15.0	118.0		10.0	113.0	
Total Split (%)				14.7%	14.7%	14.7%	10.0%	78.7%		6.7%	75.3%	
Yellow Time (s)				4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)				1.5	1.5	1.5	1.0	1.0		1.0	1.2	
Lost Time Adjust (s)				-1.0	-1.0	-1.0	0.0	0.0		1.0	-1.0	
Total Lost Time (s)				4.5	4.5	4.5	4.0	5.0		5.0	4.2	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Recall Mode				Max	Max	Max	None	C-Max		None	C-Max	

Intersection Summary

Area Type: Other

Cycle Length: 150

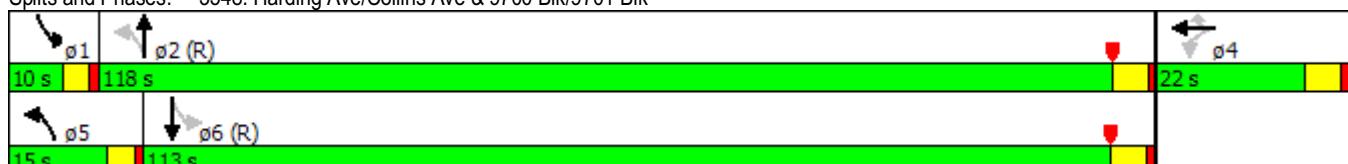
Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 3548: Harding Ave/Collins Ave & 9700 Blk/9701 Blk



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	39	0	5	16	2479	51	19	1965	12
Number				7	4	14	5	2	12	1	6	16
Initial Q (Q _b), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1900	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h				42	0	5	17	2666	55	20	2113	13
Adj No. of Lanes				2	0	1	1	3	0	1	3	0
Peak Hour Factor				0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %				0	0	0	0	2	2	0	2	2
Cap, veh/h				422	0	188	222	3967	81	125	4095	25
Arrive On Green				0.12	0.00	0.12	0.01	0.77	0.77	0.02	1.00	1.00
Sat Flow, veh/h				3619	0	1615	1810	5131	105	1810	5216	32
Grp Volume(v), veh/h				42	0	5	17	1758	963	20	1373	753
Grp Sat Flow(s), veh/h/ln				1810	0	1615	1810	1696	1845	1810	1695	1857
Q Serve(g_s), s				1.6	0.0	0.4	0.3	36.6	37.2	0.4	0.0	0.0
Cycle Q Clear(g_c), s				1.6	0.0	0.4	0.3	36.6	37.2	0.4	0.0	0.0
Prop In Lane				1.00		1.00	1.00		0.06	1.00		0.02
Lane Grp Cap(c), veh/h				422	0	188	222	2622	1426	125	2662	1458
V/C Ratio(X)				0.10	0.00	0.03	0.08	0.67	0.68	0.16	0.52	0.52
Avail Cap(c_a), veh/h				422	0	188	330	2622	1426	164	2662	1458
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(l)				1.00	0.00	1.00	1.00	1.00	1.00	0.51	0.51	0.51
Uniform Delay (d), s/veh				59.2	0.0	58.7	3.4	8.0	8.1	9.3	0.0	0.0
Incr Delay (d2), s/veh				0.5	0.0	0.3	0.1	1.4	2.6	0.1	0.4	0.7
Initial Q Delay(d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln				0.8	0.0	0.4	0.1	17.3	19.8	0.3	0.1	0.3
LnGrp Delay(d), s/veh				59.7	0.0	59.0	3.5	9.4	10.7	9.4	0.4	0.7
LnGrp LOS				E		E	A	A	B	A	A	A
Approach Vol, veh/h						47			2738		2146	
Approach Delay, s/veh						59.6			9.8		0.6	
Approach LOS						E			A		A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	6.8	121.2		22.0	6.0	122.0						
Change Period (Y+Rc), s	4.0	* 5.2		5.5	4.0	* 5.2						
Max Green Setting (Gmax), s	6.0	* 1.1E2		16.5	11.0	* 1.1E2						
Max Q Clear Time (g_c+l1), s	2.4	39.2		3.6	2.3	2.0						
Green Ext Time (p_c), s	0.0	44.2		0.1	0.0	52.7						
Intersection Summary												
HCM 2010 Ctrl Delay				6.3								
HCM 2010 LOS				A								
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓			↑		↑	↑↑↑				
Volume (vph)	408	5	0	0	10	8	589	2110	11	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)					0%			0%				0%
Storage Length (ft)	0					0	300		0	0		0
Storage Lanes	1					0	1		0	0		0
Taper Length (ft)	25				25			50			25	
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30				30			30			30
Link Distance (ft)		292				368			663			419
Travel Time (s)		6.6				8.4			15.1			9.5
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%			0%			0%
Shared Lane Traffic (%)	49%											
Turn Type	Split	NA			NA		Prot	NA				
Protected Phases	4	4			8		5	2				
Permitted Phases												
Detector Phase	4	4			8		5	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0			7.0		4.0	4.0				
Minimum Split (s)	25.0	25.0			12.0		24.0	31.0				
Total Split (s)	37.0	37.0			12.0		81.0	101.0				
Total Split (%)	24.7%	24.7%			8.0%		54.0%	67.3%				
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0				
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0				
Lost Time Adjust (s)	-1.0	-1.0			-1.0		-1.0	-1.0				
Total Lost Time (s)	4.0	4.0			4.0		4.0	4.0				
Lead/Lag							Lag					
Lead-Lag Optimize?												
Recall Mode	Ped	Ped			None		Max	C-Max				

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 105 (70%), Referenced to phase 2:NBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Splits and Phases: 3005: Collins Ave & 96th St



Lane Group	ø6
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Turn Type	
Protected Phases	6
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	17.0
Total Split (s)	20.0
Total Split (%)	13%
Yellow Time (s)	2.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	
Recall Mode	Max
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑			↑		↑	↑↑↑				
Volume (veh/h)	408	5	0	0	10	8	589	2110	11	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1864	0	0	1900	1900	1900	1863	1900			
Adj Flow Rate, veh/h	433	0	0	0	11	8	620	2221	12			
Adj No. of Lanes	2	1	0	0	1	0	1	3	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	0	0	0	0	0	0	2	0			
Cap, veh/h	525	276	0	0	33	24	1339	3863	21			
Arrive On Green	0.15	0.00	0.00	0.00	0.03	0.03	0.74	0.74	0.73			
Sat Flow, veh/h	3548	1864	0	0	1024	745	1810	5220	28			
Grp Volume(v), veh/h	433	0	0	0	0	19	620	1442	791			
Grp Sat Flow(s), veh/h/ln	1774	1864	0	0	0	1769	1810	1695	1858			
Q Serve(g_s), s	17.8	0.0	0.0	0.0	0.0	1.6	20.3	28.9	28.9			
Cycle Q Clear(g_c), s	17.8	0.0	0.0	0.0	0.0	1.6	20.3	28.9	28.9			
Prop In Lane	1.00		0.00	0.00		0.42	1.00		0.02			
Lane Grp Cap(c), veh/h	525	276	0	0	0	57	1339	2509	1375			
V/C Ratio(X)	0.83	0.00	0.00	0.00	0.00	0.33	0.46	0.57	0.58			
Avail Cap(c_a), veh/h	828	435	0	0	0	94	1339	2509	1375			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(l)	0.58	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	62.0	0.0	0.0	0.0	0.0	71.2	7.7	8.8	8.8			
Incr Delay (d2), s/veh	1.8	0.0	0.0	0.0	0.0	2.5	1.2	1.0	1.8			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(-26165%), veh/ln	8.9	0.0	0.0	0.0	0.0	0.8	10.4	13.8	15.4			
LnGrp Delay(d), s/veh	63.9	0.0	0.0	0.0	0.0	73.7	8.9	9.8	10.6			
LnGrp LOS	E					E	A	A	B			
Approach Vol, veh/h	433				19				2853			
Approach Delay, s/veh	63.9				73.7				9.8			
Approach LOS	E				E				A			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4				8				
Phs Duration (G+Y+Rc), s	115.0		26.2					8.8				
Change Period (Y+Rc), s	5.0		5.0					5.0				
Max Green Setting (Gmax), s	77.0		34.0					7.0				
Max Q Clear Time (g_c+1), s	30.9		19.8					3.6				
Green Ext Time (p_c), s	13.3		1.4					0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			17.3									
HCM 2010 LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑↑					↑↑↑	↑	
Volume (vph)	0	437	618	0	603	0	0	0	0	58	1684	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)					0%				0%			0%
Storage Length (ft)	0			0		0			0	0		0
Storage Lanes	0			1		0		0		0	0	1
Taper Length (ft)	25				25			25			25	
Right Turn on Red			No			Yes				Yes		Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		283			292			669			260	
Travel Time (s)		6.4			6.6			15.2			5.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	2%	0%	2%	0%	0%	0%	0%	0%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)			20%									
Turn Type	NA	Perm		NA						Perm	NA	Perm
Protected Phases	4			8							6	
Permitted Phases		4								6		6
Detector Phase	4	4		8						6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0						4.0	4.0	4.0
Minimum Split (s)	24.0	24.0		24.0						71.0	71.0	71.0
Total Split (s)	76.0	76.0		76.0						74.0	74.0	74.0
Total Split (%)	50.7%	50.7%		50.7%						49.3%	49.3%	49.3%
Yellow Time (s)	4.0	4.0		4.0						4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0						1.0	1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0						-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0		4.0						4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max						C-Max	C-Max	C-Max

Intersection Summary

Area Type: Other

Cycle Length: 150

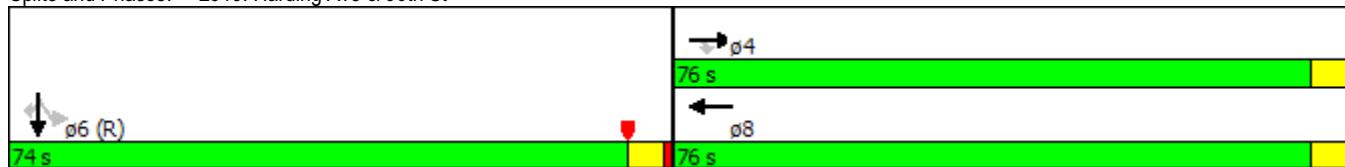
Actuated Cycle Length: 150

Offset: 14 (9%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 115

Control Type: Actuated-Coordinated

Splits and Phases: 2919: Harding Ave & 96th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	437	618	0	603	0	0	0	0	58	1684	316
Number	7	4	14	3	8	18				1	6	16
Initial Q (Q _b), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00					1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	0	1863	0				1900	1864	1881
Adj Flow Rate, veh/h	0	609	561	0	641	0				62	1791	336
Adj No. of Lanes	0	1	1	0	2	0				0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	2	2	0	2	0				1	2	1
Cap, veh/h	0	907	771	0	1722	0				76	2338	736
Arrive On Green	0.00	0.16	0.16	0.00	0.49	0.00				0.46	0.46	0.46
Sat Flow, veh/h	0	1863	1583	0	3725	0				165	5083	1599
Grp Volume(v), veh/h	0	609	561	0	641	0				696	1157	336
Grp Sat Flow(s), veh/h/ln	0	1863	1583	0	1770	0				1856	1696	1599
Q Serve(g_s), s	0.0	46.1	50.5	0.0	17.0	0.0				48.6	41.9	21.5
Cycle Q Clear(g_c), s	0.0	46.1	50.5	0.0	17.0	0.0				48.6	41.9	21.5
Prop In Lane	0.00			1.00	0.00		0.00			0.09		1.00
Lane Grp Cap(c), veh/h	0	907	771	0	1722	0				854	1561	736
V/C Ratio(X)	0.00	0.67	0.73	0.00	0.37	0.00				0.82	0.74	0.46
Avail Cap(c_a), veh/h	0	907	771	0	1722	0				854	1561	736
HCM Platoon Ratio	1.00	0.33	0.33	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(l)	0.00	1.00	1.00	0.00	0.87	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	51.7	53.5	0.0	24.1	0.0				35.0	33.2	27.7
Incr Delay (d2), s/veh	0.0	4.0	6.0	0.0	0.5	0.0				8.5	3.2	2.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln	0.0	24.9	23.5	0.0	8.4	0.0				27.0	20.3	9.9
LnGrp Delay(d), s/veh	0.0	55.6	59.5	0.0	24.7	0.0				43.5	36.4	29.7
LnGrp LOS		E	E		C					D	D	C
Approach Vol, veh/h	1170			641						2189		
Approach Delay, s/veh	57.5			24.7						37.6		
Approach LOS		E		C						D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				77.0		73.0		77.0				
Change Period (Y+Rc), s				5.0		5.0		5.0				
Max Green Setting (Gmax), s				72.0		68.0		72.0				
Max Q Clear Time (g_c+l1), s				52.5		50.6		19.0				
Green Ext Time (p_c), s				2.2		2.9		2.3				
Intersection Summary												
HCM 2010 Ctrl Delay				41.4								
HCM 2010 LOS				D								
Notes												
User approved volume balancing among the lanes for turning movement.												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	437	618	0	603	0	0	0	0	58	1684	316
Number	7	4	14	3	8	18				1	6	16
Initial Q (Q _b), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00					1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	0	1863	0				1900	1864	1881
Adj Flow Rate, veh/h	0	609	561	0	641	0				62	1791	336
Adj No. of Lanes	0	1	1	0	2	0				0	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	2	2	0	2	0				1	2	1
Cap, veh/h	0	907	771	0	1722	0				76	2338	736
Arrive On Green	0.00	0.81	0.81	0.00	0.49	0.00				0.46	0.46	0.46
Sat Flow, veh/h	0	1863	1583	0	3725	0				165	5083	1599
Grp Volume(v), veh/h	0	609	561	0	641	0				696	1157	336
Grp Sat Flow(s), veh/h/ln	0	1863	1583	0	1770	0				1856	1696	1599
Q Serve(g_s), s	0.0	20.2	24.4	0.0	17.0	0.0				48.6	41.9	21.5
Cycle Q Clear(g_c), s	0.0	20.2	24.4	0.0	17.0	0.0				48.6	41.9	21.5
Prop In Lane	0.00			1.00	0.00		0.00			0.09		1.00
Lane Grp Cap(c), veh/h	0	907	771	0	1722	0				854	1561	736
V/C Ratio(X)	0.00	0.67	0.73	0.00	0.37	0.00				0.82	0.74	0.46
Avail Cap(c_a), veh/h	0	907	771	0	1722	0				854	1561	736
HCM Platoon Ratio	1.00	1.67	1.67	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(l)	0.00	1.00	1.00	0.00	0.87	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	9.1	9.5	0.0	24.1	0.0				35.0	33.2	27.7
Incr Delay (d2), s/veh	0.0	4.0	6.0	0.0	0.5	0.0				8.5	3.2	2.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln	0.0	11.1	11.4	0.0	8.4	0.0				27.0	20.3	9.9
LnGrp Delay(d), s/veh	0.0	13.1	15.5	0.0	24.7	0.0				43.5	36.4	29.7
LnGrp LOS	B	B		C						D	D	C
Approach Vol, veh/h	1170			641						2189		
Approach Delay, s/veh	14.2			24.7						37.6		
Approach LOS	B			C						D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs				4		6		8				
Phs Duration (G+Y+Rc), s				77.0		73.0		77.0				
Change Period (Y+Rc), s				5.0		5.0		5.0				
Max Green Setting (Gmax), s				72.0		68.0		72.0				
Max Q Clear Time (g_c+l1), s				26.4		50.6		19.0				
Green Ext Time (p_c), s				2.3		2.9		2.3				
Intersection Summary												
HCM 2010 Ctrl Delay				28.7								
HCM 2010 LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑			↑↑		↑↑	↑↑			↑	
Volume (vph)	0	1239	0	0	904	1	388	0	54	1	0	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Number of Detectors	1	2			2		1	2		1	1	
Detector Template	Left	Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100			100		20	100		20	20	
Trailing Detector (ft)	0	0			0		0	0		0	0	
Turn Type	Perm	NA			NA		Split	NA		Split	NA	
Protected Phases		2			6		8	8		4	4	
Permitted Phases	2				6		8	8		4	4	
Detector Phase	2	2			6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0		4.0	4.0		5.0	5.0	
Minimum Split (s)	21.0	21.0			21.0		20.0	20.0		10.0	10.0	
Total Split (s)	99.0	99.0			99.0		39.0	39.0		12.0	12.0	
Total Split (%)	66.0%	66.0%			66.0%		26.0%	26.0%		8.0%	8.0%	
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max			C-Max		None	None		None	None	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 84 (56%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 3648: Byron/Loading & 96th St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1239	0	0	904	1	388	0	54	1	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	0	0	1863	1900	1900	1900	1900	1900	1976	1900
Adj Flow Rate, veh/h	0	1304	0	0	952	1	408	0	57	1	0	0
Adj No. of Lanes	1	2	0	0	2	0	2	1	0	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	0	2	2	0	0	0	0	0	0
Cap, veh/h	48	2708	0	0	2776	3	468	0	215	3	0	0
Arrive On Green	0.00	0.77	0.00	0.00	1.00	1.00	0.13	0.00	0.13	0.00	0.00	0.00
Sat Flow, veh/h	598	3632	0	0	3721	4	3510	0	1615	1882	0	0
Grp Volume(v), veh/h	0	1304	0	0	464	489	408	0	57	1	0	0
Grp Sat Flow(s), veh/h/ln	598	1770	0	0	1770	1862	1755	0	1615	1882	0	0
Q Serve(g_s), s	0.0	20.5	0.0	0.0	0.0	0.0	17.1	0.0	4.8	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	20.5	0.0	0.0	0.0	0.0	17.1	0.0	4.8	0.1	0.0	0.0
Prop In Lane	1.00		0.00	0.00		0.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	48	2708	0	0	1354	1425	468	0	215	3	0	0
V/C Ratio(X)	0.00	0.48	0.00	0.00	0.34	0.34	0.87	0.00	0.26	0.39	0.00	0.00
Avail Cap(c_a), veh/h	48	2708	0	0	1354	1425	796	0	366	88	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.00	0.87	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	6.5	0.0	0.0	0.0	0.0	63.7	0.0	58.4	74.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.0	0.7	0.7	2.6	0.0	0.2	32.3	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln	0.0	10.2	0.0	0.0	0.3	0.3	8.4	0.0	2.1	0.1	0.0	0.0
LnGrp Delay(d), s/veh	0.0	7.1	0.0	0.0	0.7	0.7	66.3	0.0	58.6	107.2	0.0	0.0
LnGrp LOS	A		A	A	E		E	F				
Approach Vol, veh/h	1304			953			465			1		
Approach Delay, s/veh	7.1			0.7			65.4			107.2		
Approach LOS	A		A	A			E			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s	119.8		5.2		119.8		25.0					
Change Period (Y+Rc), s	5.0		5.0		5.0		5.0					
Max Green Setting (Gmax), s	94.0		7.0		94.0		34.0					
Max Q Clear Time (g_c+l1), s	22.5		2.1		2.0		19.1					
Green Ext Time (p_c), s	8.2		0.0		8.2		0.9					
Intersection Summary												
HCM 2010 Ctrl Delay			14.8									
HCM 2010 LOS			B									



Lane Group	EBU	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑↑	↑	↑↑		↑↑	↑
Volume (vph)	6	230	909	28	1074	170	302	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11
Grade (%)					0%	0%	0%	
Storage Length (ft)		125			25		0	0
Storage Lanes		1			1		0	2
Taper Length (ft)		50			25			25
Right Turn on Red						Yes		Yes
Link Speed (mph)				30		30		30
Link Distance (ft)				244		296		285
Travel Time (s)				5.5		6.7		6.5
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	2%	0%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0
Parking (#/hr)								
Mid-Block Traffic (%)				0%		0%		0%
Shared Lane Traffic (%)								31%
Turn Type	pm+pt	pm+pt	NA	Perm	NA		Prot	Prot
Protected Phases	5	5	2		6		4	4
Permitted Phases	2	2		6				
Detector Phase	5	5	2	6	6		4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	9.0	9.0	21.0	21.0	21.0		21.0	21.0
Total Split (s)	32.0	32.0	118.0	86.0	86.0		32.0	32.0
Total Split (%)	21.3%	21.3%	78.7%	57.3%	57.3%		21.3%	21.3%
Yellow Time (s)	3.0	3.0	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	0.0	0.0	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)			0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)			3.0	5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag			
Lead-Lag Optimize?								
Recall Mode	None	None	C-Max	C-Max	C-Max		None	None

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 18 (12%), Referenced to phase 2:EBTL and 6:WBTU, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 4344: 96th St & BHS South



Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations								
Volume (veh/h)	6	230	909	28	1074	170	302	249
Number		5	2		6	16	7	14
Initial Q (Q _b), veh		0	0		0	0	0	0
Ped-Bike Adj(A_pbT)		1.00				1.00	1.00	1.00
Parking Bus, Adj		1.00	1.00		1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1863		1868	1900	1900	1900
Adj Flow Rate, veh/h		245	967		1143	181	386	195
Adj No. of Lanes		1	2		2	0	2	1
Peak Hour Factor		0.94	0.94		0.94	0.94	0.94	0.94
Percent Heavy Veh, %		0	2		2	2	0	0
Cap, veh/h		442	2818		2236	353	496	221
Arrive On Green		0.05	0.80		1.00	1.00	0.14	0.14
Sat Flow, veh/h		1810	3632		3165	485	3619	1615
Grp Volume(v), veh/h		245	967		659	665	386	195
Grp Sat Flow(s), veh/h/ln		1810	1770		1774	1782	1810	1615
Q Serve(g_s), s		4.9	11.5		0.0	0.0	15.5	17.8
Cycle Q Clear(g_c), s		4.9	11.5		0.0	0.0	15.5	17.8
Prop In Lane		1.00				0.27	1.00	1.00
Lane Grp Cap(c), veh/h		442	2818		1291	1297	496	221
V/C Ratio(X)		0.55	0.34		0.51	0.51	0.78	0.88
Avail Cap(c_a), veh/h		704	2818		1291	1297	651	291
HCM Platoon Ratio		1.00	1.00		2.00	2.00	1.00	1.00
Upstream Filter(l)		1.00	1.00		0.86	0.86	1.00	1.00
Uniform Delay (d), s/veh		3.9	4.3		0.0	0.0	62.5	63.5
Incr Delay (d2), s/veh		0.4	0.3		1.2	1.3	3.1	17.8
Initial Q Delay(d3), s/veh		0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%), veh/ln		2.4	5.6		0.4	0.5	7.9	16.2
LnGrp Delay(d), s/veh		4.3	4.6		1.2	1.3	65.6	81.4
LnGrp LOS		A	A		A	A	E	F
Approach Vol, veh/h			1212		1324		581	
Approach Delay, s/veh			4.5		1.2		70.9	
Approach LOS			A		A		E	
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+R _c), s		124.4		25.6	10.3	114.2		
Change Period (Y+R _c), s		5.0		5.0	3.0	5.0		
Max Green Setting (G _{max}), s		113.0		27.0	29.0	81.0		
Max Q Clear Time (g _{c+1}), s		13.5		19.8	6.9	2.0		
Green Ext Time (p _c), s		19.7		0.8	0.3	19.4		
Intersection Summary								
HCM 2010 Ctrl Delay			15.5					
HCM 2010 LOS			B					
Notes								
User approved volume balancing among the lanes for turning movement.								
User approved ignoring U-Turning movement.								